DVD-Video Player DVD963SA

DVD963SA /001 /171 /691

Service
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Service

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ServiceManual

CLASS 1
LASER PRODUCT

DVD VIDEO™

COMPACT disc DIGITAL VIDEO

COMPACT disc DIGITAL AUDIO

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PHILIPS

1. Technical Specifications and Connection Facilities

Specifications

PLAYBACK SYSTEM

DVD Video
SACD multi channel and SACD stereo
Video CD & SVCD
CD (CD-Recordable and CD-Rewritable)
MP3 CD

TV STANDARD (PAL/50Hz) (NTSC/60Hz)

Number of lines	625	525
Playback	Multistandard	(PAL/NTSC)

VIDEO PERFORMANCE

RGB output	0.7 Vpp into 75 ohm
YUV output	Y: 1Vpp into 75 ohm
	Pr/Cr Pb/Cb: 0.7Vpp into 75 ohm
S-Video output	Y: 1Vpp into 75 ohm
	C: 0.3Vpp into 75 ohm
Video output	1 Vpp into 75 ohm
Black Level Shift	On/Off
Video Shift	Left/Right

AUDIO FORMAT

DSD	Multichannel and Stereo
MPEG/	Compressed Digital
Dolby Digital	16, 20, 24 bits
DTS/PCM	fs, 44.1, 48, 96 kHz
MP3	96, 112, 128, 256 kbps and
(ISO 9660)	variable bit rate fs 32, 44.1, 48kHz

Full decoding of Dolby Digital and DTS multi channel sound
Analogue Stereo Sound
Dolby Surround-compatible downmix from Dolby Digital multi-channel sound
3D Sound for virtual 5.1 channel sound on 2 speakers

SACD AUDIO PERFORMANCE

D/A Converter	DSD	
SACD	fs 2.8224MHz	DC - 100kHz
Max. output voltage (0dB)	2V rms	
Channel unbalance	<0.5 dB	
Cut-off frequency	50kHz (Front)	
	40kHz (Surround, Centre, Subwoofer)	
Signal-Noise (1kHz)		-125 dB
Dynamic Range (1kHz)		-105 dB
Crosstalk (1kHz)		-120 dB
Total Harmonic Distortion (1kHz)		-100 dB

AUDIO PERFORMANCE (Without upsampling)

DA Converter	24 bits	
DVD	fs 96 kHz	4 Hz - 44 kHz
CD/Video CD	fs 44.1 kHz	4 Hz - 20 kHz
S-Video CD	fs 48 kHz	4 Hz - 22 kHz
	fs 44.1 kHz	4 Hz - 20 kHz
Signal-Noise (1kHz)		< -120 dB
Dynamic Range (1kHz)		< -95 dB
Crosstalk (1kHz)		< -110 dB
Total Harmonic Distortion (1kHz)		< -95 dB
MPEG MP3	MPEG Audio L3	

CONNECTIONS

SCART	2x Euroconnector
Y Pb/Cb Pr/Cr (480i/p)	Cinch 3x (green, blue, red)
S-Video Output	Mini DIN, 4 pins
Video Output	Cinch (yellow) 2x
Audio L+R output	Cinch (white/red)
Digital Output	1 coaxial, 1 optical
	IEC958 for CDDA / LPCM
	IEC1937 for MPEG1/2, Dolby Digital, DTS

6 channel analogue output

Audio Front L/R	Cinch (white/red)
Audio Surround L/R	Cinch (white/red)
Audio Centre	Cinch (blue)
Audio Subwoofer	Cinch (black)

CABINET

Dimensions (w x h x d)	435 x 101 x 315 mm
Weight	Approximately 4.6 Kg

POWER SUPPLY

Power inlet	110-240V, 50/60Hz
Power usage	Approx. 30W
Power usage standby	< 1W

* *typical playing time for movie with 2 spoken languages and 3 subtitle languages*

Specifications subject to change without prior notice

2. Safety Instructions, Warnings and Notes

2.1 Safety Instructions

2.1.1 General Safety

Safety regulations require that during a repair:
- Connect the unit to the mains via an isolation transformer.
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, you must return the unit in its original condition. Pay, in particular, attention to the following points:
- Route the wires/cables correctly, and fix them with the mounted cable clamps.
- Check the insulation of the mains lead for external damage.
- Check the electrical DC resistance between the mains plug and the secondary side:
  1. Unplug the mains cord, and connect a wire between the two pins of the mains plug.
  2. Set the mains switch to the 'on' position (keep the mains cord unplugged!).
  3. Measure the resistance value between the mains plug and the front panel, controls, and chassis bottom.
  4. Repair or correct unit when the resistance measurement is less than 1 MΩ.
  5. Verify this, before you return the unit to the customer/ user (ref. UL-standard no. 1492).
  6. Switch the unit 'off', and remove the wire between the two pins of the mains plug.

2.1.2 Laser Safety

This unit employs a laser. Only qualified service personnel may remove the cover, or attempt to service this device (due to possible eye injury).

Laser Device Unit

Type	:	Semiconductor laser GaAlAs
Wavelength	:	650 nm (DVD)
	:	780 nm (VCD/CD)
Output Power	:	20 mW (DVD+RW writing)
	:	0.8 mW (DVD reading)
	:	0.3 mW (VCD/CD reading)
Beam divergence	:	60 degree

Figure 2-1 Class 1 Laser Product

Note: Use of controls or adjustments or performance of procedure other than those specified herein, may result in hazardous radiation exposure. Avoid direct exposure to beam.

2.2 Warnings

2.2.1 General

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD, symbol ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools at this same potential. Available ESD protection equipment:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  – Wristband tester 4822 344 13999.
- Be careful during measurements in the live voltage section. The primary side of the power supply (pos. 1005), including the heatsink, carries live mains voltage when you connect the player to the mains (even when the player is 'off'!). It is possible to touch copper tracks and/or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A 'lightning stroke' and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.
- Never replace modules, or components, while the unit is 'on'.

2.2.2 Laser

- The use of optical instruments with this product, will increase eye hazard.
- Only qualified service personnel may remove the cover or attempt to service this device, due to possible eye injury.
- Repair handling should take place as much as possible with a disc loaded inside the player.
- Text below is placed inside the unit, on the laser cover shield:

CAUTION VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO BEAM
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
VARNING SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN
VAROI AVATT AESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTTÖMÄLLE LASER SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN
VORSICHT SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETSEN
DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
ATTENTION RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU

Figure 2-2 Warning text

2.2.3 Notes

Dolby

Manufactered under licence from Dolby Laboratories. "Dolby", "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories. Confidential Unpublished Works. ©1992-1997 Dolby Laboratories, Inc. All rights reserved.

Figure 2-3

Trusurround

TRUSURROUND, **SRS** and symbol (fig 2-4) are trademarks of SRS Labs, Inc. TRUSURROUND technology is manufactured under licence frm SRS labs, Inc.

Figure 2-4

Introduction

Thank you for purchasing this Philips DVD/SACD player. This Owner's Manual explains the basic operation of this DVD/SACD player.

Environmental Information

All unnecessary packaging has been omitted. The packaging has been made easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your DVD/SACD player consists of materials which can be recycled and reused if disassembled by a specialised company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Supplied accessories

- Remote control
- Batteries (two AA size) for remote control
- Audio cable
- CVBS cable
- SCART cable
- Owner's Manual
- AC Power Cord

Safety Information

- Before operating the DVD player, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) is identical with the voltage of your local power supply. If not, please consult your dealer.
- Place the DVD player on a flat, hard and stable surface.
- There must be sufficient room in front of the player for the disc tray to be opened.
- In cabinet, allow about 2.5cm (1 inch) of free space all around the player for adequate ventilation.
- Do not expose your player to extreme of temperature or humidity.
- If the DVD player is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the disc unit inside the DVD player. Should this occur, the DVD player would not operate normally. Leave the power on for about one hour with no disc in the DVD player until normal playback is possible.
- The mechanical parts of the set contain self-lubricating bearings and must not be oiled or lubricated.
- **When the DVD player is switched to Standby mode, it is still consuming some power. To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

Symbols Used in this Manual

The below symbols appear in some headings and notes with the following meanings:

DVD	– Description refers to playback of DVD-video discs
VCD	– Description refers to playback of Video CDs
CD	– Description refers to playback of Audio CDs
SACD	– Description refers to playback of Super Audio CDs

Helpful Hints!

- ***Some DVD video discs require specific functions or allow only limited functions during playback.***
- ***"⊘" may appears on the TV screen which means that the function is not available on that specific DVD video disc.***

Reality reproduced: Super Audio CD

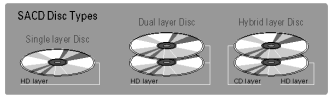
The future in digital sound reproduction is no longer limited to a close simulation of reality. The new audio standard IS reality! The human ear is no longer capable of distinguishing audible reality from digital reproduction. At Philips the future starts today with the Super Audio Compact Disc player. This Super Audio CD player combines superior sound quality with the possibility of playing almost all existing audio and video formats with a single player.

The Super Audio standard is based on Direct Stream Digital (DSD) technology. This new direct-stream digital format comprises a 1-bit system that has a digital sampling frequency that is 64 times higher than that of conventional audio CD. The results are spectacular: a frequency response of over 50k Hz and a 120dB dynamic range over the entire audible spectrum. Mixed with as many of the original frequencies as possible, the audio information audible for human ears sounds much more natural.

The next standard: hybrid disc

The Super Audio CD is the evolution of the CD that provides ultra-high-quality sound. Additional features, including multi-channel, can be offered. On the high density (HD) Super Audio CD you may have access to separate areas, containing two-channel stereo and multi-channel.

But that is not all! The hybrid version of the SACD guarantees backward compatibility with the installed base of CD and DVD players. In addition to the HD layer, the hybrid disc contains a standard density CD layer with conventional two-channel stereo CD audio information. The two layers are read from the same side of the disc. The HD layer is read by and DVD laser. The bottom reflective layer with conventional CD sound is read by the CD laser through the second, semi-transmissive HD layer.



SACD: reality in sound...and vision

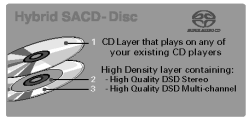
This SACD player will not only surprise you with its superior reproduction of almost all existing audio formats. Connected to your TV, your SACD player presents VCD and DVD-video information as perfect digital studio-quality images with truly 3-dimensional digital multi-channel audio.

Super Audio CD

You will recognize Super Audio CDs by the logo. There are three types of Super Audio CDs: single-layer, dual-layer and hybrid discs. Each type may contain two areas of recorded information: a High Quality Stereo area and a High Quality Multi-channel area.

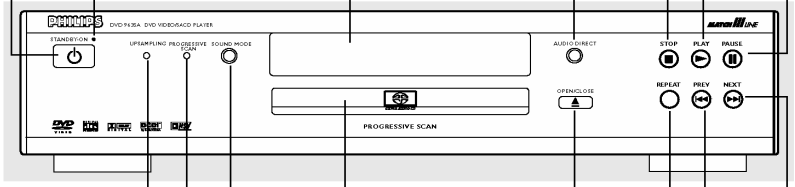
– The single layer disc may contain both information areas.
– The dual layer disc may contain both information areas but a double amount of information can be stored on the disc thanks to the second layer.
– The hybrid disc may contain not only both information areas but also a second, standard CD layer, making it playable on standard CD players.

Recorded information may vary per area. This is indicated in the disc inlay. Areas can be selected separately before or during playback, while playing Super Audio CDs via the remote control or via the On-Screen Display on your TV.


Hybrid SACD- Disc
1 CD Layer that plays on any of your existing CD players
High Density layer containing:
2 - High Quality DSD Stereo
3 - High Quality DSD Multi-channel

Functional Overview

Front Panel



STANDBY-ON
– to switch the player to standby mode or ON

STANDBY INDICATOR
– lights up when the player is in Standby mode

DISPLAY
– shows the current status of the player

Disc tray

SOUND
– selects required sound mode
- for SACD: CD, Stereo or Multi-channel (if available)
- for DVD/VCD: Stereo, Dolby Surround-compatible, 3D sound or Multi-channel

PROGRESSIVE SCAN
– LED lights up when the P-Scan is ON and the output is Progressive Output

UPSAMPLING
– LED lights up when the CD upsampling is applied

II PAUSE
– interrupts audio/video playback or moves to the next frame

► PLAY
– starts audio/video playback

■ STOP
– to stop playback

AUDIO DIRECT
– shut down video circuity to obtain better audio quality

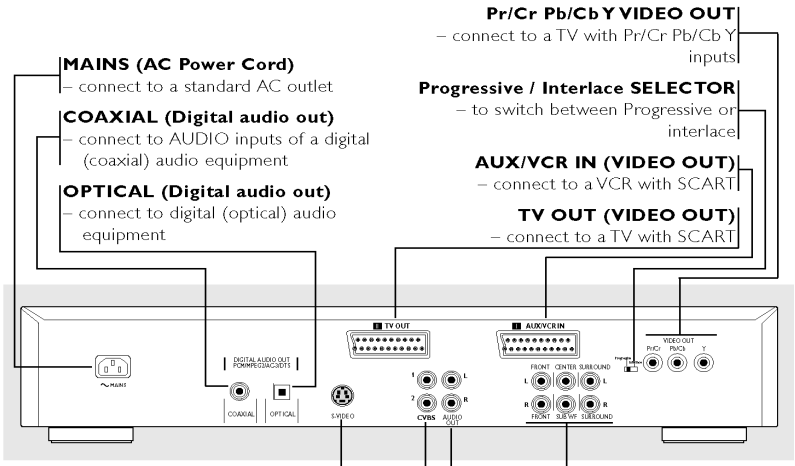
▲ OPEN/CLOSE
– to open/close the disc tray

REPEAT
– repeat chapter, track, title, disc

|◄◄ PREV
– goes to previous chapter or track

►►| NEXT
– goes to next chapter or track

Rear Panel



MAINS (AC Power Cord)
– connect to a standard AC outlet

COAXIAL (Digital audio out)
– connect to AUDIO inputs of a digital (coaxial) audio equipment

OPTICAL (Digital audio out)
– connect to digital (optical) audio equipment

S-VIDEO OUT
– connect to a TV with S-Video inputs

Pr/Cr Pb/Cb Y VIDEO OUT
– connect to a TV with Pr/Cr Pb/Cb Y inputs

Progressive / Interlace SELECTOR
– to switch between Progressive or interlace

AUX/VCR IN (VIDEO OUT)
– connect to a VCR with SCART

TV OUT (VIDEO OUT)
– connect to a TV with SCART

CVBS (VIDEO OUT)
– connect to CVBS Video inputs of a TV

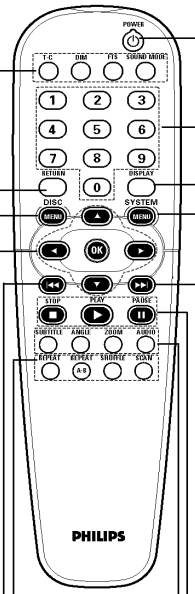
AUDIO OUT (Left/Right)
– connect to AUDIO inputs of a TV

MULTICHANNEL AUDIO OUT
(For connection to a stereo and multichannel receiver)
– center speaker, subwoofer, front and surround speakers connection

Caution: Do not touch the inner pins of the jacks on the rear panel. Electrostatic discharge may cause permanent damage to the unit.

Functional Overview

Remote Control



T-C
– select title/chapter

DIM
– to select 3 different brightnesses for the display

FTS
– activate/deactivate Favorite Track Selection

SOUND MODE
– selects required sound mode
• for SACD: CD, Stereo or Multi-channel (if available)
• for DVD/VCD: Stereo, Dolby Surround-compatible, 3D sound or Multi-channel

RETURN
– go back to previous menu

DISC MENU
– access menu of a DVD disc

◄ ► ▲ ▼
– (left/right/up/down) select an item in the menu

OK
– acknowledge menu selection

|◄◄
– search backward* / go to a previous chapter or track

REPEAT
– repeat chapter, track, title, disc

REPEAT (A-B)
– repeat a specific segment

SHUFFLE
– play tracks in random order

SCAN
– play the first 10 seconds of each track/chapter within a disc

POWER ⏻
– switch DVD player ON or go to standby-on mode

0-9 numerical key pad
– select numbered items in a menu

DISPLAY
– activate/deactivate CD text if available on the disc (audio CDs)
– to display bit rate indicator during playback (DVD, SVCD)

SYSTEM MENU
– access or remove player's system menu

►►|
– search forward* / next chapter or track

STOP (■)
– stop playback

PLAY (►)
– start playback

PAUSE (II)
– pause playback temporarily / frame-by-frame playback

SUBTITLE
– subtitle language selector

ANGLE
– select DVD camera angle

ZOOM
– enlarge video image

AUDIO
– audio language selector

** Press and hold key for about two seconds*

Basic Connections

- Please refer to the instruction books of your TV, VCR, Stereo System or other devices as necessary to make the best connections.
- Make one of the following connections, depending on the capabilities of your existing equipment.

The following guidelines are options for the best picture and sound quality available on your DVD/SACD player.

Picture

1 Use the CVBS Video Ouput for good picture quality.
2 Use S-Video Output for the better picture quality.
3 Use SCART or Pr/Cr Pb/Cb Y Output for best picture quality.

Note:
– RGB (on SCART) and YUV (Pr/Cr Pb/Cb Y) output signals are not available at the same time.
– To choose your preferred output connection, refer section "Personal Preferences - YUV/RGB switching".

Sound

1 Digital audio connections provide the clearest sound. Connect the DVD player's DIGITAL AUDIO OUT (either COAXIAL or OPTICAL) to your amplifier or receiver.

Note:
– Digital output is not available for SACD and MP3 discs.

2 If digital connections are not possible, connect the DVD player's LEFT/RIGHT FRONT, CENTRE, SUBWOOFER, LEFT/RIGHT SURROUND connectors to the corresponding inputs on your multi-channel audio/video receiver.
3 If both the above connections are not possible, connect the DVD player's Left and Right (white and red) AUDIO OUT to your amplifier, receiver, stereo or TV.

Warning!
– Never make or change connections with the power switched on.
– Connect the DVD/SACD player directly to your TV, instead of eg. a VCR, to avoid distortion because DVD video discs are copy protected.
– Do not connect the DVD/SACD player AUDIO OUT to the PHONO IN of your amplifier or receiver.

Connecting to a TV

1 Connect the SCART (TV OUT) on the DVD player to the corresponding connector on the TV.

Note:
– Ensure that the "TV" indication on SCART cable is connected to the TV set and "DVD" indication on SCART cable is connected to the DVD player.

If your TV is not equipped with SCART input, you can select the following connection:

If your TV has a CVBS Video input connector,
1 Connect the CVBS VIDEO OUT on the DVD player to the CVBS VIDEO IN on the TV.
2 Connect the Left and Right AUDIO OUT on the DVD player to the Left and Right AUDIO IN on the TV.

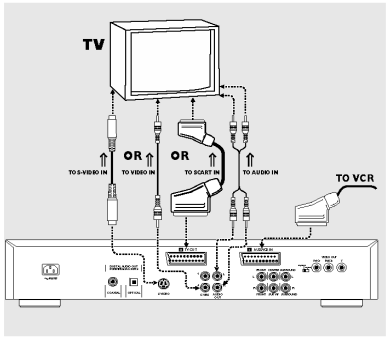
If your TV has a S-Video input connector,
1 Connect the S-VIDEO OUT on the DVD player to the S-VIDEO IN on the TV.
2 Connect the Left and Right AUDIO OUT on the DVD player to the Left and Right AUDIO IN on the TV.

Preparation

Cinemalink (on SCART)

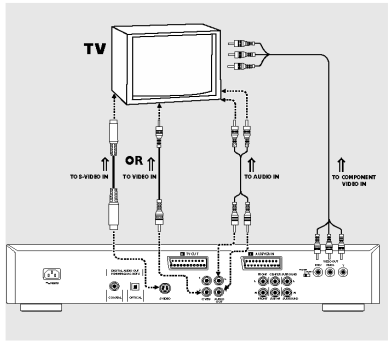
This DVD player is equipped with cinemalink feature (from Philips) which allows a more complete control of your home audio/video (AV) equipment.

Cinemalink interconnection plug & playback will enable the AV system to recognise the users intention and automatically switch the necessary controls or input source accordingly. This will reduce the necessity of having multiple control inputs for all AV equipments (eg. TV and Amplifier).



If your TV has a component video (Pr/Cr Pb/Cb Y) input connector,

1. Connect the Pr/Cr Pb/Cb Y VIDEO OUT jacks on the DVD player to the corresponding INPUT on the TV using an optional Pr/Cr Pb/Cb Y cable.
2. Connect the Left and Right AUDIO OUT jacks of the DVD player to the AUDIO Left/Right INPUT on the TV.

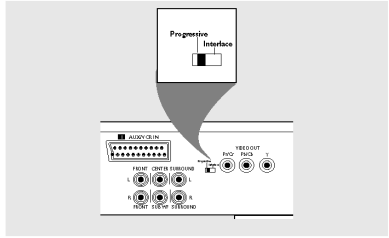


Progressive / Interlace SELECTOR

This switch will change the type of signal output from the Component Video Out on the player.

Interlace:
Select this setting when connected to a standard (interlace format) TV.

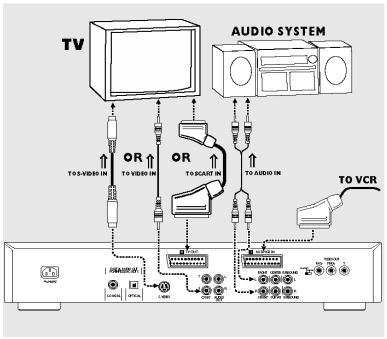
Progressive:
Select progressive when you have a TV that can accept progressive signals (480/525p) to enjoy accurate colour reproduction and high quality images.



Connecting to an Audio System

1. You can also listen to the sound of audio CDs, stereo SACDs and DVD Video discs by connecting to an optional stereo system.
2. Connect the FRONT LEFT/RIGHT AUDIO OUT on the DVD player multichannel audio output to the Left and Right AUDIO IN on the stereo system.

Important:
– For the best sound quality with playback of audio CDs and stereo SACDs, always use the left and right connectors of the high-quality stereo/ Multi-channel audio output. The separate stereo output is intended only for connection to video equipment such as a TV set.

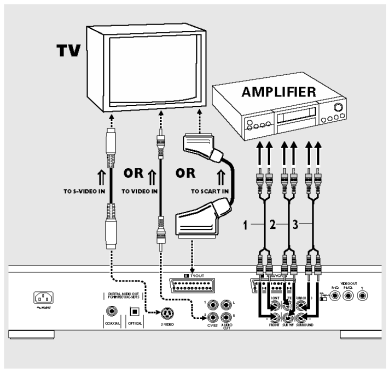


Connecting to a Multi-channel Audio/(Video) receiver with 6 connectors

This DVD/SACD player contains a multi-channel decoder. This enables playback of SACDs & DVDs recorded in Multi-channel. You only need to select Multi-channel using the Sound Mode key.

1. Connect the audio Left and Right outputs for Front speaker connection ***(1)*** to the corresponding input sockets on your receiver using the audio cable supplied.
2. Connect the audio outputs for Center speaker and Subwoofer connection ***(2)*** to the corresponding inputs on your receiver using an optional audio cable.
3. Connect the audio Left and Right outputs for Surround speaker connection ***(3)*** to the corresponding inputs on your receiver using an optional audio cable.

Note:
– If the subwoofer is equipped with its own amplifier, the Subwoofer connection should be connected directly to the subwoofer.

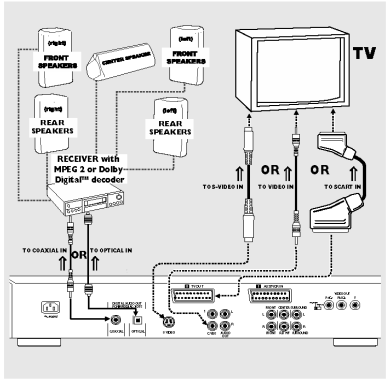


Connecting to a Digital Audio Equipment

If your receiver has an Dolby Digital, DTS or MPEG2 decoder,

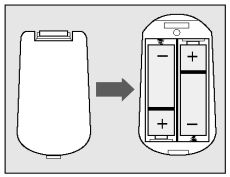
1 Connect the COAXIAL or OPTICAL DIGITAL AUDIO OUT of the DVD player to the COAXIAL or OPTICAL DIGITAL AUDIO IN on your receiver.
2 Set the DVD player's digital output to ALL *(see "Personal Preferences")*

Notes:
– SACD audio is NOT available on the Digital audio output (coaxial or optical) as per the SACD standard.
– If the audio format of the digital output does not match the capabilities of your receiver, the receiver will produce a strong, distorted sound or no sound at all.
– MP3 Audio is not available on the Digital Output.



Inserting batteries into the Remote Control

1 Open the battery cover.
2 Insert batteries (AA size) with the correct polarity as indicated by the + and – symbols inside the battery compartment.
3 Close the cover.



CAUTION!
– Remove batteries if they are exhausted or not to be used for a long time.
– Do not use old and new or different types of batteries in combination.
– Batteries contain chemical substances, so they should be disposed off properly and kept away from children.

Using the Remote Control

- Direct the remote control at the remote sensor of the DVD/SACD player.
- Do not drop the remote control.
- Do not leave the remote control near extremely hot or humid places.
- Do not spill water or put anything wet on the remote control.

NTSC/PAL Conversion

DVD discs are recorded according to colour system eg. NTSC and PAL. Your TV also operates according to a colour system.
This DVD player is compatible with NTSC and PAL. To play on this DVD player, the colour system of the DVD disc, the TV and the DVD player should match. If all three are not the same, the DVD may play in only black and white, the picture may roll continuously or the picture may appear distorted.
To activate the conversion refer to page 17.

Switching On

1 Connect the AC power cord to the power outlet.
2 Switch on the TV and DVD/SACD player.
3 Set the TV to the correct Video IN channel. (eg. EXT1, EXT2, AV1, AV2, AUDIO/VIDEO, etc - refer to your TV owner's manual for detail).
➜ The player display lights up and the default screen appears on the TV.
4 If you are using an external equipment (eg. audio system or receiver), turn them on and select the appropriate input source that was used to connect to the DVD/SACD player output. Refer to the equipment owner's manual for detail.

Notes:
– If you do not have a proper picture or sound, refer to 'Troubleshooting' section.

Menu Bars on TV Screen

- Operations can be carried out directly via the multiple menu bars on the TV screen.
- The following functions are available via the menu bars. Pressing SYSTEM MENU keys repeatedly will toggle through menu bar 1, menu bar 2, menu bar 3 and menu bar OFF:

Menu bar 1

From the left,
Personal Preferences ➜ Subtitle Language ➜ Audio Language ➜ Colour ➜ Sound

The following functions are available with activated disc via the menu bars:

Menu bar 2

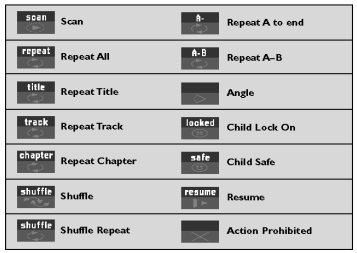
From the left,
Step by step playback ➜ Slow motion ➜ Fast motion ➜ Angle ➜ Zoom

Menu bar 3

From the left,
Title ➜ Chapter ➜ Time Search ➜ Favourite Track Selection (FTS) ➜ Wakeup Timer

Temporary Feedback Field Icons

These icons will appear on the top left hand corner of your TV screen.



English

Personal Preferences

In the Personal Preferences settings menu, you can customize your player to suit your own particular requirements.

General operation:

1 Press SYSTEM MENU on the remote control.
2 The Tools icon will be highlighted in the menu bar.
3 Press ▼ to activate the Personal Preferences menu.

To select a preferred menu language,

1 Press ▼ until the Language icon is highlighted.
2 Press ▶ to enter the submenu and ▼ to choose Menu language.
3 Use the ▲ ▼ to select your preferred menu language.

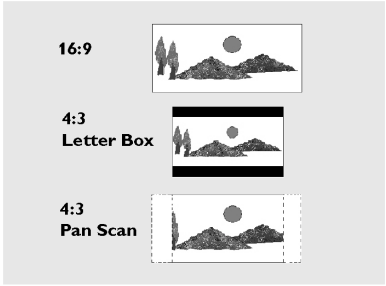
For navigation and selection in Personal preferences,

1 Use the ◀ ▶ ▲ ▼ keys to toggle through the functions and select your preferred option.
2 Press OK to confirm a highlighted selection.
The following items are available:

Picture

– TV Shape

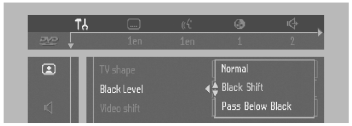
Select the aspect ratio of the TV to be connected.
16:9 ➜ when you connect a wide-screen TV to the DVD/SACD player.
4:3 LETTER BOX ➜ when you connect a normal TV to the DVD/SACD player. Displays a wide picture with black bands displayed on the upper and lower portions of the TV screen.
4:3 PAN SCAN ➜ when you connect a normal TV to the DVD/SACD player. Displays the wide picture on the whole TV screen with a portion automatically cut off.



Note:
– Pan Scan is subject to availability on the disc.

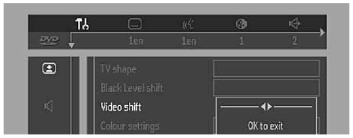
– Black level shift (NTSC output only)

Select Normal, Black Shift or Pass Below Shift for adapting the different colour dynamics to obtain richer contrasts.



– Video shift

Use this setting to personalize the position of the picture on your TV by scrolling it to the left or right.

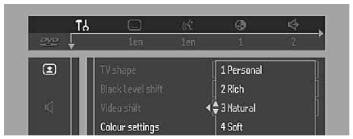


English

– Smart Picture

- **Colour settings** (not applicable on Component Video Output)

  You can select one of five predefined sets of colour settings and one set (Personal) which you can define yourself.
  You can also press SMART PICTURE key (on the front panel) to access the colour settings in the menubar.



- When **Personal** is selected it allows you to fine-tune saturation, brightness and contrast
- Use ▲ or ▼ keys to adjust the values of these parametres. Press OK or ◀ to exit.

– TV System (NTSC/PAL Conversion)

Allows you to select between PAL, NTSC and AUTO mode depending on your TV. Player's default setting is set to AUTO.
The conversions supported are as follows:

Disc		Output format		
Type	Format	Selected mode		
		NTSC	PAL	AUTO
DVD	NTSC	NTSC	PAL	NTSC
	PAL	Not Supported	PAL	PAL
VCD	NTSC	NTSC	PAL	NTSC
	PAL	NTSC	PAL	PAL

1 In the Personal Preferences Menu, select **TV System**.
2 Press ▲ or ▼ to select PAL, NTSC or AUTO.

Notes:
– If you have a PAL only TV, ensure that your TV System setting is PAL.
– AUTO can only be selected when using a TV that supports both the NTSC and PAL systems (multisystems).
– This setting is applicable for CVBS output on cinch and SCART only.
– Slight picture distortions may occur due to this conversion. This is normal. Thus, the AUTO format is most suitable for the best picture quality.

– Digital Crystal Clear (on Pr/Cr Pb/Cb Y Progressive Scan Video Out only)

Digital Crystal Clear (DCC) allows you to fine-tune the following parametres on the progressive scan output.

- **Chroma Delay** - is where the Chroma (colour) and luma (brightness) signals are not synchronised. This allows you to adjust the advance delay of the chroma signal to yield a perfectly clear picture.
- **Gamma** - allows you to adjust the intensity of the picture non-linearly. A positive value allows you to bring out low level detail in dark scenes, while a negative value will emphasize contrast.
- **Sharpness** - allows you to adjust sharpness of the picture.
- **DCDi** (New Directional Correlation De-interlacing) - computes and tracks the angle of edge to fill in the missing pixel on the TV screen. Switching DCDi ON will optimise the image quality significantly, especially during the slow motion playback.
  Aspect Ratio - to adjust the ratio of the pictures on the TV screen.
  NO LINEAR STRETCH: for display of 4:3 image on 16:9 TV with non-linear stretching (centre portion of screen is stretch less than the side).
  PILLER BOX: for display of 4:3 image on 16:9 TV without stretching.
  OFF: No aspect ration adjustment
- **True Life** - produces a more dynamic picture by increasing the picture contrast and the colour intensity.

Note:
– DCDi, Aspect Ratio and True Life adjustment are only applicable on Progressive Scan output.

Sound

– Digital output

- Digital output selection enables you to specify the type of digital output suitable for your receiver.
- Select OFF to deactivate the DIGITAL AUDIO OUT.
- Select PCM only if your receiver is not capable of decoding multichannel audio.
- Select ALL (default setting), if you had connected your DIGITAL AUDIO OUT to a multichanel decoder receiver.

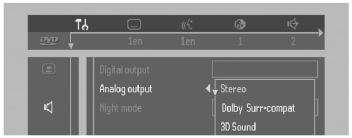
Note:
– Digital output is not available for SACD and MP3 discs.

– Analogue output

Select Stereo, Dolby Surround-compatible, 3D Sound or Multi-channel.
Multi-channel: Select this setting when using a multi-channel audio/(video) receiver with six inputs. In this mode, the player will perform DTS decoding or Dolby Digital 5.1-channel decoding when applicable, and Dolby Pro Logic decoding on DVD-Video and Video-CD discs with 2-channel sound tracks. No Dolby Pro Logic decoding is done with (Super) Audio CD discs.
Stereo: In this setting, the 5.1 audio channels are down-mixed to a stereo signal. Select this setting when connecting to a TV, stereo amplifier/ receiver, etc.

Notes:
– Multichannel output and downmixed stereo output are not available simultaneously.
– When multichannel is selected as analogue output, the AUDIO OUT (Left/ Right) will deliver the Centre channel data and not the downmixed Left/Right.

Dolby Surround-compatible: Select this setting when using an equipment with a Dolby Surround Pro Logic decoder. In this setting, the 5.1 audio channels (Dolby Digital, MPEG-2, DTS) are downmixed to a Dolby Surround-compatible 2-channel output.
3D-Sound: In a setup without rear speakers (analogue stereo output), 3D Sound remixes the six channels of digital surround into a two-speaker output while retaining all of the original audio information. The result is the listening sensation of being surrounded by multiple speakers.
During DVD or Video-CD playback, these values can be selected directly with the 'SOUND MODE' key.



– Night Mode

When set to ON, the dynamics of your sound output are optimised. High volume outputs are softened, enabling you to watch your favourite action movie without disturbing others.

– Karaoke vocal

Put this setting to ON only when a multi-channel karaoke DVD is being played. The karaoke channels on the disc will then be mixed into a normal stereo sound.

– SACD Bass Management Bypass

Allows you (with suitable speaker system) to bypass the bass management system for multi-channel SACD playback.
This helps to preserve maximum sound quality of your SACD.

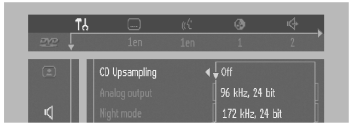
Warning!
– When SACD Bass Management Bypass is ON, speaker setting will not be applied during multi-channel SACD playback.

– PCM Output

Allows to select PCM digital output between 48kHz and 96kHz. When 48kHz has been selected, 96kHz PCM data, (if available on disc) will be converted to 48kHz.
Some 96kHz DVD are copy protected. If your PCM output selection is 96kHz, the digital output will be muted to comply with the standards. In such cases, select 48kHz to enable digital output.

– CD Upsampling

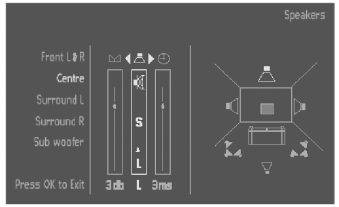
Allows you to upsample your CD from 44.1 kHz / 16 bit to various higher sampling rate for superior CD reproductions.
The selections are: OFF, 96kHz/24bits, 172kHz/ 24bits.
The upsampling of CD can be toggle "ON/OFF" via the AUDIO key on the remote control.



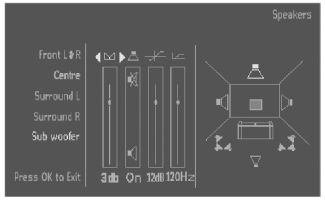
Speaker settings (Advance Bass Management)

Allows you to select speaker settings, volume balance and delay time, and to test the speaker settings.
Speaker settings are only active on the Multi-Channel Audio outputs for both DVD and SACD.

Movie mode
When movie mode is set, speaker settings will not be applied during playback in the SACD Stereo mode.



Music mode - SACD
When music mode is set, speaker settings will be applied during playback in the SACD Stereo mode only.



Additional adjustments available in SACD bass managements are:
Cross over frequency adjustment: 80Hz, 100Hz and 120Hz.
Filter slop adjustment: 12dB/oct, 18dB/oct and 24db/oct.

Note:
– These additional adjustments are available in the subwoofer adjustments.

6 Channel settings

Front speaker

L (Large): When the front speakers can reproduce low frequency signals below 120Hz

S (Small): When the front speakers cannot produce low frequency signals below 120Hz

Center Speaker

L (Large): When the center speaker can reproduce low frequency signals below 120Hz

S (Small): When the center speaker cannot produce low frequency signals below 120Hz

Off: When the center speaker is not connected

Surround speakers

L (Large): When the surround speakers can reproduce low frequency signals below 120Hz

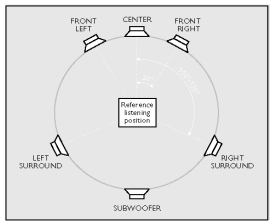
S (Small): When the surround speakers cannot produce low frequency signals below 120Hz

Off: When the surround speakers are not connected

Subwoofer

On: When you connect a subwoofer

Off: When a subwoofer is not connected

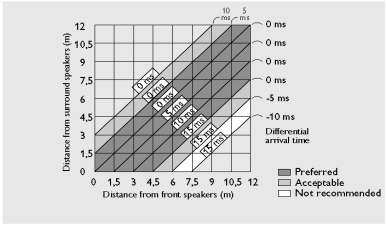


Delay times

The DVD player is set to reproduce correctly synchronized Digital Surround Sound in a listening area where the surround speakers are about 150cm nearer to the listening position than the front speakers, and the center speaker is in line with the front speakers. To adjust for other listening area arrangements, adapt delay times according to the following:

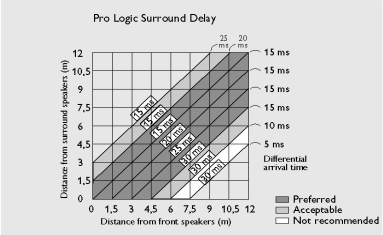
Digital Surround

Measure the distances in centimeters from the front speaker plane and from the surround speaker plane to the listening positioning plane. Subtract the surround distance from the front distance and divide by 30. The result is the required Surround Channel delay time in milliseconds.
If the center speaker is on the front speaker plane, no center speaker delay is needed. If, however, it is nearer to the listening position, measure the distance in centimeters between the front and center speaker planes, and divide by 30. The result is the required Center Channel delay time in milliseconds.



Dolby Pro Logic

If the delay times for Surround Channel and Center Channel are set for Digital Surround mode, the delay times for Dolby Pro Logic mode will automatically be calculated and set.



Language

Selecting disc languages:

Menu/Audio/Subtitle language

- This is to select the audio language, subtitle language and the language used in TV screen menus or DVD menus which will always be used for every disc to be played back.
- If the language selected is not available on the disc, the default language designated by each disc will be selected.

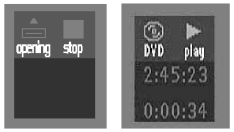
Features

– Access Control

Access Control contains the following features:
Child Lock - When Child Lock is set to ON, a 4-digit code needs to be entered in order to playback discs.
Parental control - Allows the conditional presentation of DVDs containing Parental Control information (see 'Access Control' section).

– Status Window

Displays the current status of the player and appears with the menu bar. When disc playback is stopped, it is displayed with the 'Temporary Feedback Field' in the default screen. See 'On-Screen Display' information;
Factory setting is ON. Select OFF to suppress display of the Status Window.



– Low Power Standby

If this is set to ON, the player will go in low-power standby when the standby button is pressed (front panel or remote control).

– PBC (Playback Control - for VCD)

The Playback Control can be set to ON or OFF (see section "Special VCD & SVCD Features" for details).

– Help text

When set to ON, help text describes the icons selected. Select OFF if you no longer require the help text.

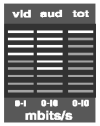
– Smart Power OFF

Puts the set to standby after a predefined time. This can be set to ENABLE or DISABLE.

Other Feature

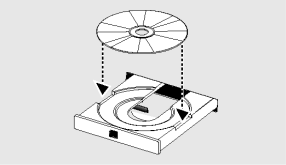
– Bit Rate Indicator

Press the **DISPLAY** key to activate the bit rate indicator. When activated, the bit rate for video and audio, as well as the total bit rate is displayed.
This is only applicable during playback of DVD and SVCD discs.



Basic Playback

1 Press STANDBY ON on the front panel.
2 Press OPEN/CLOSE ▲ on the front panel to open disc loading tray.
3 Place the chosen disc in the tray, with the label facing up.
4 Press OPEN/CLOSE ▲ again to close the tray.
➜ READING appears in the status window and on the player display, and playback starts automatically.



Notes:
– *DVDs may have a region code. Your player will not play discs that have a region code different from the region code of your player.*
– *If 'Child Lock' is set to ON and the disc inserted is not authorised, the 4-digit code must be entered and/or the disc must be authorised (see 'Access Control').*

Playing a DVD-Video

- DVD video discs may have one or more TITLES, and each TITLE may have one or more CHAPTERS.
- Playback stops at the end of each TITLE.

Playing a title

1 Insert a disc and close the tray, playback starts automatically.
➜ The TV screen and DVD player's display show the type of disc loaded, disc's information and playing time.
2 When the Disc Menu appears on the TV screen, use ▼▲◄► keys or numerical keys on the remote control to select an option and continue playback.
3 If the titles are numbered , press the numerical keys or use the ▼ ▲ keys to select desired title in the menubar.
4 To stop playback, press **STOP**.

Smart Resume

The playback of a disc can be interrupted at any point and then resumed from the point where the playback was last stopped.
The RESUME feature applies not only to the disc in the player, but also the last 20 discs you have played.

To interrupt playback,

- Press STOP to interrupt playback.
➜ The help line text appears *"Press Stop again to start from beginning"* for 5 seconds.

Playback when a disc has not been ejected,

- Pressing PLAY will automatically resume playback from the point where playback was interrupted.
OR
- Press STOP again and then press PLAY,
➜ Playback will starts from the beginning of the discs.
- If you press PLAY when resume icon appears on the screen, resume playback starts from the point where playback was interrupted.

Playback when a disc has been ejected,

- Reload the disc.
➜ Playback starts from the beginning of the disc.
- If you press PLAY when resume icon appears on the screen, resume playback starts from the point where playback was interrupted.

Note:
– *Resume feature is also applicable to VCDs and SVCDs.*

Video CD and Super Video CD

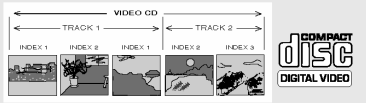
The current VCD 2.0 and Super Video CD 1.0 standard features are:

Support following VCD and SVCD formats:

Features	Video CDs 2.0	Super Video CDs 1.0
Video bit rate resolution NTSC resolution PAL	MPEG-1 constant 1,150 Kbps 352x240, 29.97Hz 352x288, 25Hz	MPEG-2 variable up to 2.6 Mbps 480x480 interlaced, 29.97Hz 480x574 interlaced, 25Hz
Still picture (photo) resolution NTSC resolution PAL	MPEG-1 352x240, 704x480 352x288, 704x576	MPEG-2 (1 Frame) 480x480, 704x480 480x576, 704x576
Audio sampling bit rate audio channels surround sound	MPEG-1 layer II 44.1KHz 224Kbps 1 stereo / 2 mono Stereo with Dolby Pro-Logic	MPEG-1 layer II 44.1KHz 32-384Kbps < 2 stereo / 4 mono MPEG-1 (5+1) extension
Overlay graphics/text sub-channels coding		overlay video plane <= 4 4 colour CLUT (2bits/pixel)

Following formats can't be supported in VCD:
– *HQ-VCD is encoded at 2.4Mbps or 2.6Mbps*
– *XVCD (eXtended VCD) with higher resolution and data rate.*
– *The file ending with "DIVX" format.*

- Video CDs may have one or more TRACKS, and TRACKS may have one or more INDEXES.
- To make easy and convenient access, you can move between TRACKS and INDEXES.
- Some Video CDs have Play Back Control (PBC), which is a predefined playback sequence stored on the disc *(see Playback Control section)*.



Playing a disc

1 Insert the disc and close the tray, playback starts automatically.
➜ The number of tracks and the total playing time of the disc will appear on the TV screen and DVD player's display.
2 Press **PLAY**.
➜ The current track number and its elapsed playing time will be displayed.
3 Playback will stop at the end of the disc.
4 To stop playback, press **STOP**.
5 Disc Resume feature is also applicable for VCDs and SVCDs *(see "Smart Resume" section)*.

Playing a Super Audio CD

- Super Audio CDs contain only TRACKS
- Select tracks using the menubar on the TV screen or by pressing the numerical keys directly.
- If SACD-text or CD-text is available on the disc, it will be displayed on both the TV screen and player's front panel.
- Favourite Track Selection (FTS) programming is NOT possible on SACD discs.

Playing a disc

1 Insert a disc and close the tray, playback starts automatically.
➜ The TV screen will display the number of tracks for selection, current playing status and current playing layer.
2 Playback will stop at the end of the disc.
3 To stop playback, press **STOP**.

Sound Mode - SACD playback

- If the default Sound mode is set to multi channel and the inserted disc does not contain this mode, the player will automatically select the stereo mode.
- On hybrid discs (with SACD and CD layers), the player will always start playing the SACD layer.
- While the SACD disc is being played, the currently played layer is shown on the player front display as follows:
SA 6 (for SACD Multi channel)
SA 2 (for SACD stereo)
CD (for CD layer of SACD)
- You can switch between SACD multi channel and SACD stereo layers (depending on availability of the mode on the disc) while the disc is playing by pressing the Sound Mode button on the remote control or the player front. The mode change will be indicated on the player front display.
- Switching between the SACD and CD layer is not possible during playback.

1 Press **STOP** to stop the playback.
2 Press Sound Mode button on the remote control or the player front to toggle between SACD multi channel, SACD stereo and CD layers (depending on availability of the mode on the disc).
➜ The mode change will be indicated on the player front display.

Playing an Audio CD

- Audio CDs contain only TRACKS.
- They can be played on your DVD player with the audio output connected to a stereo system or to your TV.
- If CD-text is available on the disc, it will be displayed on both the TV screen and player's front display.
- Select tracks using the menubar on the TV screen or by pressing the numerical keys directly.
- Your DVD player also allows you to compile Favourite Track Selection (FTS) programmes for your discs by selecting or excluding tracks of your choice *(see FTS Programme - Audio CDs)*.

Playing a disc

1 Insert a disc and close the tray, playback starts automatically.
➜ The TV screen will display the number of tracks for selection and current playing status.
2 Playback will stop at the end of the disc.
3 To stop playback, press **STOP**.

Special DVD Features

DVDs may contain menus to navigate the disc and access special features. Press the appropriate numerical key or use the ▼, ▲, ▶, ◀ keys to highlight your selection in the DVD menu and press OK to confirm.

Title/Disc menu

1 Press **DISC MENU**.
➜ If the current title has a menu, the menu will appear on the screen. Otherwise, the disc menu will be displayed.
2 If disc menu is available on the disc, audio language, subtitle options, chapters for the title and other options will appear for selection.
3 To remove the title/disc menu, press **DISC MENU** again.

Camera Angle

Some discs contain scenes which have been shot simultaneously from various angles.
This DVD player allows you to select the desired camera angle.

- When the DVD player encounters a scene shot in multiple angles, it will give an indication on the "Temporary Feedback Field."
➜ The angle icon remains displayed until multiple angles are no longer available.
- Use the ▲/▼ to select the required angle.
➜ Playback changes to the selected angle.
- You can also select (**ANGLE**) in the menu bar or press the **ANGLE** button on the remote control directly.

Changing the audio language

1 Select (**AUDIO**) in the menu bar or press the **AUDIO** button on the remote control directly.
2 Press **AUDIO** or ▲/▼ repeatedly to select the different languages.

Subtitle Language

1 Select (**SUBTITLE**) in the menu bar or press the **SUBTITLE** button on the remote control directly.
2 Press **SUBTITLE** or ▲/▼ repeatedly to select the different subtitles.

Special VCD & SVCD Features

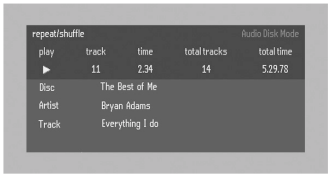
Playback Control (PBC)

Playback control is a feature on some Videos CDs / Super Video CDs that enables interactive use.
Video CD discs with Playback Control features enables user to access a selected track directly from the disc menu.
1 Load a Video CD with PBC and press **PLAY**.
2 Go through the menu with the keys indicated on the TV screen until your chosen passage starts to playback. If a **PBC** menu consists of a list of tracks, you can select a track directly.
3 Enter your choice with the numerical keys (0-9).
4 Press RETURN to go back to the previous menu, if applicable on the menu.
5 You may also select **PBC OFF** under Personal Preferences.
➜ When set to OFF, PBC menus are not activated for further playback.

Special CD, SACD & MP3 Features

CD text, SACD text and MP3 text

1 Some CD, SACD or MP3-CD discs may contain text information (eg. track name, album name, artist name etc.) which will appear on the DVD/SACD player and TV screen during playback.
2 By default, CD text display is set to ON.
3 To switch off the CD text display, press DISPLAY on the remote control during playback.
4 Press DISPLAY on the remote control again to switch on the text display mode.



General Features

Note:
– Unless stated, all operations described are based on remote control use. Some operations can be carried out using the menu bar on the TV screen.

Moving to another title/chapter

DVD VCD

When a disc has more than one title/track or chapter, you can move to another title/chapter as follows:
1 Press **SYSTEM MENU**, then select ⊤ or ◯ in the menu bar.
2 Press ▲▼ or numerical keys to select a title/chapter.

CD SACD

1 Press ▶▶| or |◀◀ briefly during playback to go to the next track or to return to the beginning of the currect track respectively.
2 Press |◀◀ twice briefly to step back to the previous track.
3 To go directly to any track, enter the track number using the numerical keys (0-9).

Search

DVD VCD SACD

1 Select (FAST MOTION) in the menu bar and press ▼.
2 Use the ◀ ▶ keys to select the required speed: -32, -8 or -4 (backward), or +4, +8, +32 (forward).
3 Select 1 to play the disc at normal speed again.
4 To exit FAST MOTION mode, press **PLAY** or ▲.

CD

- To search forward or backward through different speeds, you can also hold down ▶▶| or |◀◀ for more than two seconds.

Operation

Slow Motion DVD VCD

1 Select (SLOW MOTION) in the menu bar and press ▼.
➜ Playback will pause.
2 Use the cursor keys ◄► to select the required speed: -1, -1/2, -1/4 or -1/8 (backward), or +1/8, +1/4, +1/2 or +1 (forward).
3 Select 1 to play the disc at normal speed again.
4 If ❚❚ is pressed, the speed will be set to zero (PAUSE).
5 To exit slow motion mode, press **PLAY**.

Still Picture and Frame-by-frame playback DVD VCD

1 Select (**STEP**) in the menu bar and press ▼.
➜ Playback will pause.
2 Use the cursor keys ◄► to select the previous or next picture frame.
3 To exit step by step playback, press **PLAY** or ▲.

Note:
– *You can also activate frame-by-frame playback by pressing the PAUSE key repeatedly on the remote control.*

Scan DVD VCD CD SACD

Scanning plays the first 10 seconds of each chapter/track on the disc.
1 Press **SCAN**.
2 To continue playback at your chosen chapter/track, press **SCAN** again or press **PLAY**.

Repeat

DVD

Repeat chapter/title/disc

- To repeat the current chapter, press REPEAT.
  ➜ REPEAT CHP appears on the front display.
- To repeat the current title, press REPEAT a second time.
  ➜ REPEAT TTL appears on the front display.
- To repeat the entire disc, press REPEAT a third time.
  ➜ REPEAT DISC appears on the front display.
- To exit Repeat mode, press REPEAT a fourth time.

VCD CD SACD

Repeat track/disc

- To repeat the current track, press REPEAT.
  ➜ REPEAT TRK appears on the front display.
- To repeat the entire disc, press REPEAT a second time.
  ➜ REPEAT DISC appears on the front display.
- To exit Repeat mode, press REPEAT a third time.

Repeat A-B DVD VCD CD SACD

– DVD-Video Discs: repeat a sequence in a title
– Video and Audio CDs: repeat a sequence in a track

1 Press REPEAT A-B at your chosen starting point.
2 Press REPEAT A-B again at your chosen end point.
➜ REPEAT A-B appears briefly on the front display, and the repeat sequence begins.
3 To exit the sequence, press REPEAT A-B.

Shuffle

DVD

This shuffles the playing order of chapters within a title, if the title has more than one chapter.
1 Press SHUFFLE during playback.
➜ **SHUFFLE** appears on the screen for about two seconds.
2 To return to normal playback, press SHUFFLE again.

VCD CD SACD

This shuffles the playing order of tracks within a disc , if the disc has more than one tracks.
1 Press SHUFFLE during playback.
➜ **SHUFFLE** appears on the screen for about two seconds.
2 To return to normal playback, press SHUFFLE again.

Time search DVD VCD

The Time Search function allows you to start playing at any chosen time on the disc.
1 Select (TIME SEARCH) in the menu bar and press ▼.
➜ Playback will pause.
➜ The elapsed playing time is displayed in a time edit box.
2 Enter hours, minutes and seconds from left to right in the time edit box using remote control numerical key pad.
➜ Each time an item has been entered, the next item will be highlighted.
3 Press OK to confirm the selected time.
➜ The time edit box will disappear and playback starts from the selected time position on the disc.

4 Press SYSTEM MENU to remove the menu bar.

Zoom DVD VCD

The Zoom function allows you to enlarge the video image and to pan through the enlarged image.
1 Select (**ZOOM**).
2 Press ▲/▼ to activate the **ZOOM** function and select the required zoom factor: 1.33 or 2 or 4.
➜ Playback will continue.
➜ The selected zoom factor and '*Press OK to pan*' appears below the menu bar.
➜ The zoomed picture will appear on the TV screen.
3 Press OK to confirm the selection.
➜ The panning icon appears on the screen.
4 Use the ◄►▲▼ keys to pan across the screen.
5 When OK is pressed only the panned picture will be shown on the screen.
6 To exit **ZOOM** mode, select zoom factor to "Off" (zoom factor 1) in the menu bar.

FTS Video/Audio Programme

- The FTS-Video function allows you to store your favourite titles and chapters (DVD) and favourite tracks and indexes (VCD, CD) for a particular disc in the player memory.
- Favourite Track Selection (FTS) list contains up to 20 items (titles, chapters).
- The most recent programme list will be placed on top of the existing list.

DVD VCD

Storing a Programme

1 Load a disc and stop playback.
2 Select **VIDEO FTS** ☑ in the menu bar.
3 Press ▼ to open the menu bar.
➜ The **VIDEO FTS** ☑ menu appears.

Storing titles/tracks

1 Press ▼ to select **TITLES/TRACKS**.
2 Use ► and ◄ to select the require title/tracks.
3 Press OK to store the entire selected title/tracks.
➜ The title number will be added to the list of selections.

Storing chapters/indexes

1 Press ▼ on the selected chapter/indexes number.
➜ The chapter/indexes number will be highlighted.
2 Use ▶ and ◀ to select the required chapter number.
3 Press OK to confirm the selection.
➜ The selected chapter/indexes confirmation will be added to the list of selections.
4 Press SYSTEM MENU to exit the **VIDEO FTS** ☑ menu.

Switching a Programme ON/OFF

1 Use ▲▼ to move and select desired tracks.
2 Press ▶ or ◀ to select either ON or OFF.

Erasing a selection in a Programme

1 While playback is stopped, select **VIDEO FTS** ☑ in the menu bar.
2 Use ▼ to select **PROGRAM**.
3 Use ▶ and ◀ to select the required number.
4 Press OK to erase the selection.
5 Press SYSTEM MENU to exit.

Erasing all selections

1 While playback is stopped, select **VIDEO FTS** ☑ in the menu bar.
2 Use ▼ to select **CLEAR ALL** and press OK.
➜ All selections will be erased.
3 Press SYSTEM MENU to exit.

CD

Storing a Programme

1 Load a disc and stop playback.
2 Press ▼ to go to the list of available tracks.
3 Use ▶ and ◀ to select the required tracks or directly using remote control numeric key.
4 Press OK to store the selected tracks.
➜ The track number will be added to the list of selections.

Switching a Programme ON/OFF

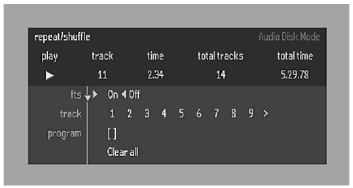
1 Use ▲▼ to move and select desired tracks.
2 Press ▶ or ◀ to select either ON or OFF.

Erasing a track in a Programme

1 Use ▼ to go to the programmed tracks.
2 Use ▶ and ◀ to select the required number.
3 Press OK to erase the selection.
4 Press SYSTEM MENU to exit.

Erasing all selections

- Use ▼ to select **CLEAR ALL** and press OK.
➜ All selections will be erased.



Note:
– Audio track programming function is not available for MP3-CD and SACD discs.

Auto Wake-up Timer

The wake-up timer allows your player to turn on after a preset time.

1 Select in the menu bar.
2 Press ▼.
➜ Time edit box will appear.
3 Use the ▲ or ▼ to select the sleep time. The maximum time you can select is 600 minutes. Selection is made by 30 minutes steps each time.
4 Press OK to confirm the selection.
5 The Wake-up Timer will activate when the set is switched to standby-mode.

MP3 Disc Features

Support following MP3-CD formats (ISO9660 format):

- Max. 30 characters
- Max. nested directory is 8 levels
- The max. ALB number is 32
- Supported VBR bit-rate
- Supported sampling frequencies for MP3 disc are: 32 kHz, 44.1 kHz, 48 kHz
- Supported Bit-rates of MP3 disc are: 32, 64, 96, 128, 192, 256 (kbps)

Following formats can't be supported

- The files like *.WMA, *.AAC, *.DLF, *.M3U, *.PLS
- Chinese filenames
- The non-session closed discs
- The discs recorded under UDF format

Downloading MP3 files from the Internet or copying songs from your own legal discs is a delicate process.

Sound Quality	Bit Rate	Approximate Reduction Ratio	Approximate total MP3-CD time	Comment
AM radio	32 kbps	40 : 1	40 hrs	Sound quality significantly affected – not recommended.
FM radio	64 kbps	20 : 1	20 hrs	
Near-CD	**96 kbps**	**15 : 1**	**15 hrs**	**Balanced sound quality – compression rate**
CD-like	**128 kbps**	**10 : 1**	**10 hrs**	
CD*	256 kbps	5 : 1	5 hrs	Compression rate low – suggest to play CDs instead
CD*	320 kbps	3 : 1	3 hrs	

You may experience an occasional "skip" while listening to your MP3 files. This is normal.

Additional note for MP3 disc Playback:

– In compliance with the SDMI, digital-out is muted while playing MP3 discs.
– Due to the recording nature of Digital Audio MP3 (DAM), only Digital Audio music will play.
– The disc reading time may exceed 10 seconds due to the large number of songs compiled onto one disc.
– For multi-session discs, only the first session will be available.

Album/Title

This feature allows you to view and select the next or previous MP3 disc Album/Title.

1 Press ▲/▼ to scroll through the previous or next Album.
2 Press ◀/▶ to scroll through the previous or next Track.
3 You can also select the desired album/track number directly using the numeric keys on the remote control.

Note:
*– **In STOP mode:** numbers are used for ALBUM selection.*
*– **In PLAY mode:** numbers are used for TRACK selection.*

- Only the following functions are possible for MP3 discs:
  – STOP / PLAY / PAUSE
  – SKIP NEXT / PREVIOUS
  – REPEAT (TRACK / ALBUM / DISC)

MP3 Discs - Album/Track/Disc

- To repeat a track, press REPEAT.
➜ **REPEAT TRK** appears on the player display.
- To repeat an album, press REPEAT a second time.
➜ **REPEAT ALBM** appears on the player display.
- To repeat the entire disc, press REPEAT a third time.
➜ **REPEAT DISC** appears on the player display.
- To exit REPEAT mode, press REPEAT a fourth time.
➜ **REPEAT OFF** appears on the player display.

Access Control

Child Lock DVD VCD

Activating/deactivating the Child Lock

1 When disc playback is stopped, select **ACCESS CONTROL** in the Personal Preferences menu using the ▲/▼ keys.
2 Enter a 4-digit code of your own choice twice.
3 Move to "**CHILD LOCK**" using the ▲/▼ keys.
4 Move to 🔒 / 🔓 using the ▶ keys.
5 Select 🔒 using the ▲/▼ keys.
6 Press OK or ◀ to confirm, then press ◀ again to exit the Personal Preferences menu.
➜ Now unauthorised discs will not be played unless the 4-digit code is entered.
7 Select 🔓 to deactivate the **CHILD LOCK**.

Notes:
Confirmation of the 4-digit code is necessary when:
– The code is entered for the very first time (see above),
– The code is changed or cancelled (see 'Changing the 4-digit code'),

Authorising discs

1 Insert the disc.
➜ The 'child safe' dialog will appear.
2 You will be asked to enter your secret code for 'Play Once 'or 'Play Always.'
● If 'Play Once', disc can be played when in the player and the player is ON.
● If 'Play Always', disc will become authorised and can always be played, even if the Child Lock is set to ON.

Notes:
– The player memory can maintain 120 authorised ('Child safe') disc titles. A disc will be placed in the list when 'Play Always' is selected.
– Each time a 'child safe' disc is played, it will be placed on top of the list. When the list is full, the last disc in the list will be replaced when a new disc is added.
– Double-sided DVDs and multi-volume VCDs may have a different ID for each side. In order to make the disc 'child safe', each side has to be authorised.

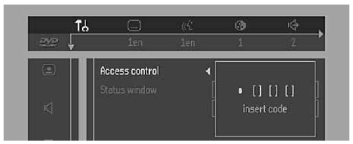
Locked
Access Control
Play once
Play always
Choose play once for deleting disk from list.
Choose play always for inserting disk in child-safe list.

Deauthorising discs

1 Insert the disc.
➜ Playback starts automatically.
2 Press ■ while ☺ is visible.
➜ The ☹ will appear and the disc is now deauthorised.

Parental Control DVD

Movies on DVDs may contain scenes not suitable for children. Therefore, discs may contain 'Parental Control' information which applies to the complete disc or to certain scenes on the disc. These scenes are rated from 1 to 8, and alternative, more suitable scenes are available on the disc. Ratings are country dependent. The 'Parental Control' feature allows you to prevent discs from being played by your children or to have certain discs played with alternative scenes.



Activating/Deactivating Parental Control

1 When disc playback is stopped, select **ACCESS CONTROL** in the Personal Preferences menu using the ▲/▼ keys.
2 Enter your 4-digit code. If necessary, enter the code a second time.
3 Move to **Parental Control** using the ▲/▼ keys.
4 Move to value adjustment (1-8) using the ▶ key.
5 Then use the ▲/▼ keys or the numerical keys on the remote control to select a rating from 1 to 8 for the disc inserted.

Rating 0 (displayed as '– –'):
Parental Control is not activated. The Disc will be played in full.

Ratings 1 to 8:
The disc contains scenes not suitable for children. If you set a rating for the player, all scenes with the same rating or lower will be played. Higher rated scenes will not be played unless an alternative which has the same rating or lower is available on the disc. If no suitable alternative is found, playback will stop and the 4-digit code has to be entered.
6 Press OK or ◀ to confirm, then press ◀ again to exit the Personal Preferences menu.

Country

1 When disc playback is stopped, select **ACCESS CONTROL** in the Personal Preferences menu using the ▲/▼ keys.
2 Enter the 4-digit code.
3 Move to **CHANGE COUNTRY** using the ▼ key.
4 Press the ▶ key.
5 Select a country using ▲/▼.
6 Press OK or ◀ to confirm, then press ◀ again to exit the menu.

Changing the 4-digit code

1 When disc playback is stopped, select **ACCESS CONTROL** in the Personal Preferences menu using the ▲/▼ keys.
2 Enter the current 4 digit code.
3 Move to **CHANGE CODE** using the ▼ and press the ▶ key.
4 Enter the new 4-digit code.
5 Enter the code a second time and reconfirm by pressing OK.
6 Press ◀ to exit the menu.
➜ The new 4 digit code will be take effect.

If you forget your 4 digit code

1 Press ■ to exit the 'Child Safe' screen.
2 Select **ACCESS CONTROL** in the Personal Preferences menu using the ▲/▼ keys.
3 The 4-digit code can be cancelled by pressing ■ four times in the 'Access Control' dialog.
4 You can then enter a new code (twice!) as described above in 'Changing the 4 digit code'.

Parental Control Disclaimer

This DVD/SACD player features the **PARENTAL CONTROL** system which is to activate when playing DVD discs furnished with certain software coding only.
Also note that at the time of release of this DVD/SACD player, certain aspects of the technical standards had not been settled between set makers and the disc industries.
On this basis, Philips cannot guarantee the functioning of the **PARENTAL CONTROL** system and denies any liability associated with unintended watching of disc content.
If in doubt, please make sure the disc plays according to your **PARENTAL CONTROL** settings before you allow children access to the player.

Maintenance

English

Cleaning the Cabinet

- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs

- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the centre out. Do not wipe in a circular motion.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analogue records.

Cleaning the disc lens

- After prolonged use, dirt or dust may accumulate at the disc lens. To ensure good playback quality, clean the disc lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with the cleaner.

Troubleshooting

WARNING

Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair.

Problem	Solution
No power	– Check if the AC power cord is properly connected.
No picture	– Check if the TV is switched on. – Check the video connection.
Distorted picture	– Sometimes a small amount of picture distortion may appear . This is not a malfunction.
Completely distorted picture or black/white picture with DVD/SACD or Video CD	– Make sure the NTSC/PAL setting at the DVD player matches the video signal of your television. (See NTSC/PAL Conversion/Settings)
No sound or distorted sound	– Adjust the volume. – Check that the speakers are connected correctly.

English

Troubleshooting

Problem	Solution
No audio at digital output	– Check the digital connections. – Check the settings menu to make sure the digital output is set to ALL or PCM. – Check if the audio format of the selected audio language matches your receiver capabilities.
No sound and picture	– Check that the SCART cable is connected to the correct device (See Connecting to a TV)
Disc can't be played	– Ensure the disc label is facing up. – Check if the disc is defective by trying another disc.
Picture freezes momentarily during playback	– Check the disc for fingerprints/scratches and clean with a soft cloth wiping from centre to edge.
No return to start-up screen when disc is removed	– Reset the unit by switching the player off, then on again.
The player does not respond to the remote control	– Aim the remote control directly at the sensor on the front of the player. – Reduce the distance to the player. – Replace the batteries in the remote control. – Re-insert the batteries with their polarities (+/– signs) as indicated.
Buttons do not work or player stops responding	– To completely reset the player, unplug the AC cord from the AC outlet for 5-10 seconds.
Player does not respond to some operating commands during playback.	– Operations may not be permitted by the disc. Refer to the instructions of the disc.
DVD/SACD Video player cannot read CDs/DVDs	– Use a commonly available cleaning CD/DVD to clean the lens before sending the DVD/SACD player for repair.

If you are unable to remedy a problem by following these hints, consult your dealer or service centre (HOTLINE).

4. Mechanical-, Dismantling Instructions, and Service Hints

4.1 Dismantling Instructions

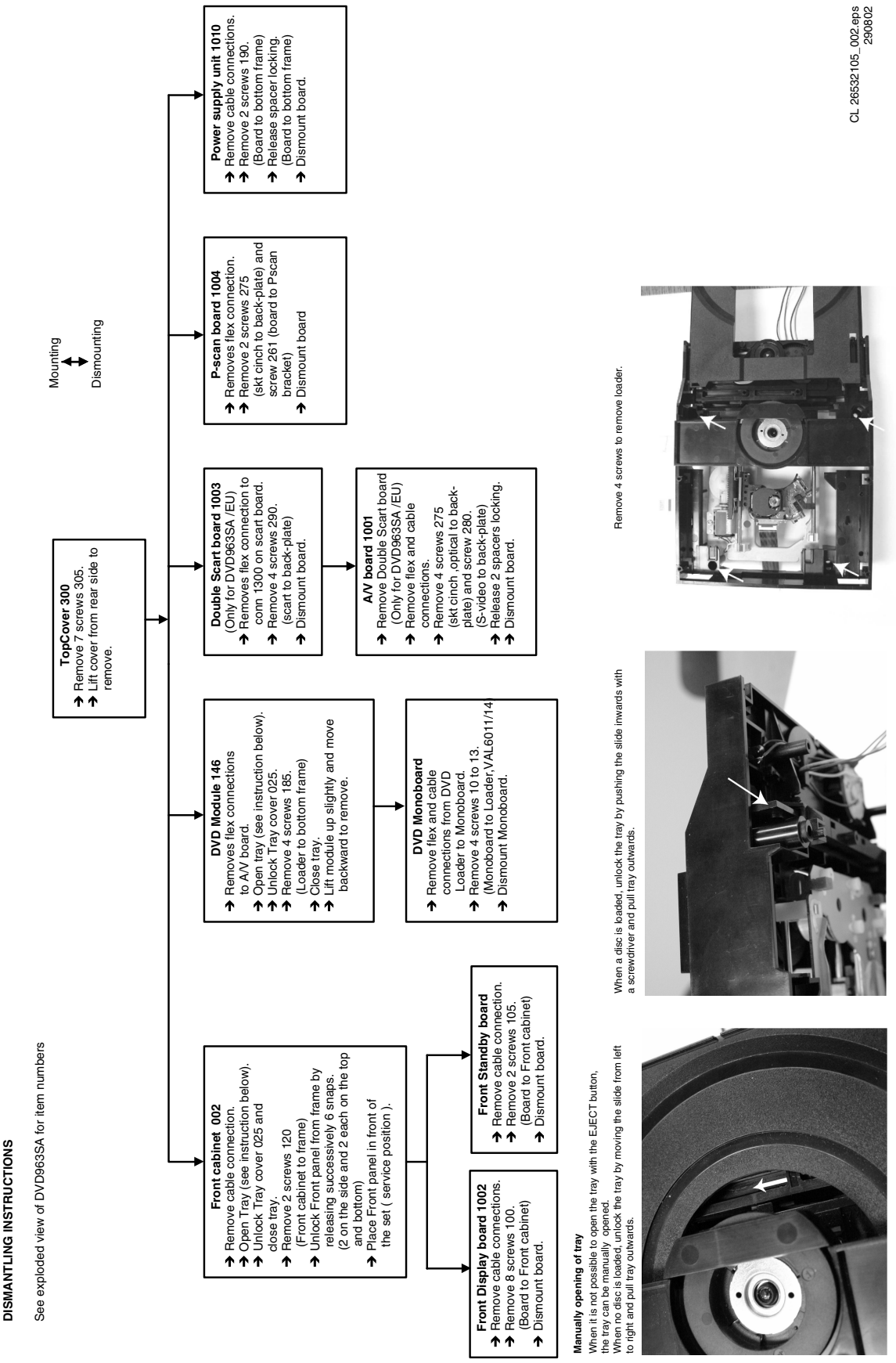

DISMANTLING INSTRUCTIONS
See exploded view of DVD963SA for item numbers
Mounting
Dismounting
TopCover 300
→ Remove 7 screws 305.
→ Lift cover from rear side to remove.
Front cabinet 002
→ Remove cable connection.
→ Open Tray (see instruction below).
→ Unlock Tray cover 025 and close tray.
→ Remove 2 screws 120 (Front cabinet to frame)
→ Unlock Front panel from frame by releasing successively 6 snaps. (2 on the side and 2 each on the top and bottom)
→ Place Front panel in front of the set (service position).
Front Display board 1002
→ Remove cable connections.
→ Remove 8 screws 100. (Board to Front cabinet)
→ Dismount board.
Front Standby board
→ Remove cable connection.
→ Remove 2 screws 105. (Board to Front cabinet)
→ Dismount board.
DVD Module 146
→ Removes flex connections to A/V board.
→ Open tray (see instruction below).
→ Unlock Tray cover 025.
→ Remove 4 screws 185. (Loader to bottom frame)
→ Close tray.
→ Lift module up slightly and move backward to remove.
DVD Monoboard
→ Remove flex and cable connections from DVD Loader to Monoboard.
→ Remove 4 screws 10 to 13. (Monoboard to Loader,VAL6011/14)
→ Dismount Monoboard.
Double Scart board 1003
(Only for DVD963SA /EU)
→ Removes flex connection to conn 1300 on scart board.
→ Remove 4 screws 290. (scart to back-plate)
→ Dismount board.
A/V board 1001
→ Remove Double Scart board (Only for DVD963SA /EU)
→ Remove flex and cable connections.
→ Remove 4 screws 275 (skt cinch ,optical to back-plate) and screw 280. (S-video to back-plate)
→ Release 2 spacers locking.
→ Dismount board.
P-scan board 1004
→ Removes flex connection.
→ Remove 2 screws 275 (skt cinch to back-plate) and screw 261 (board to Pscan bracket)
→ Dismount board
Power supply unit 1010
→ Remove cable connections.
→ Remove 2 screws 190. (Board to bottom frame)
→ Release spacer locking. (Board to bottom frame)
→ Dismount board.
Manually opening of tray
When it is not possible to open the tray with the EJECT button, the tray can be manually opened.
When no disc is loaded, unlock the tray by moving the slide from left to right and pull tray outwards.
When a disc is loaded, unlock the tray by pushing the slide inwards with a screwdriver and pull tray outwards.
Remove 4 screws to remove loader.
CL 26532105_002.eps
290802

Figure 4-1 Dismantling Instructions

4.2 Exploded View

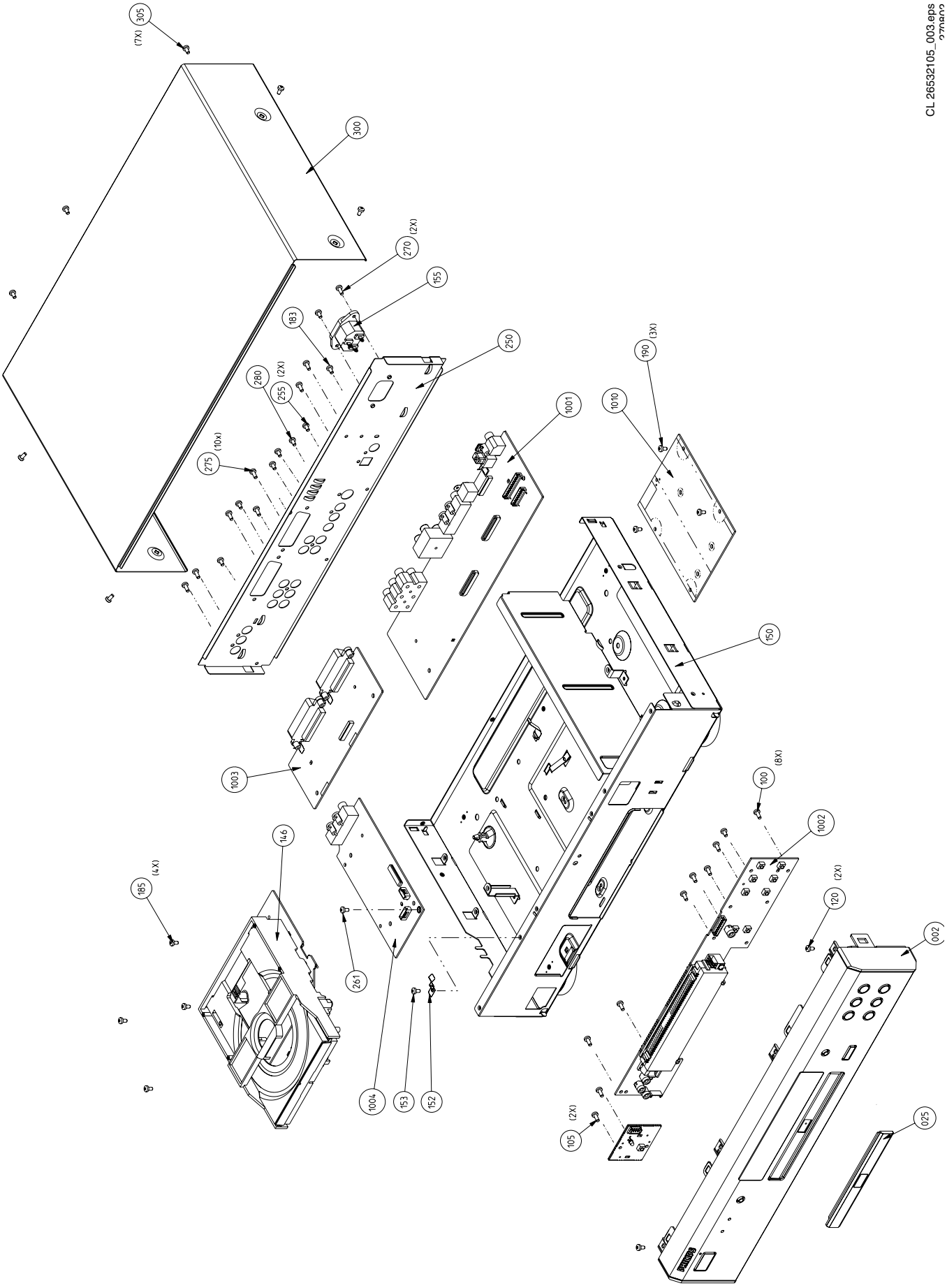


Figure 4-2 Exploded View

4.3 Service Hints

4.3.1 Switched Mode Power Supply

The power supply unit has to be replaced in case of failure. The schematic provided in the manual is only for information and no service parts will be available.

4.3.2 DVD Module

This module can be repaired as follows:

1. The VAL6011/14 is a combination of loading mechanism and DVD-mechanism. Both are not repairable units and in case of failure, it has to be replaced with a new loader VAL6011/14.

   Note: When replacing with a new VAL6011/14, two solder joints have to be removed after connecting the OPU flex foil to the mono board.
   The solder joints, which shortcircuits the laser diodes to ground, are for protection against ESD. Refer to figures 2-5 and 2-6 for location of solder joints.
2. The mono board has to be repaired down to component level. Repair handling of the monoboard requires a workshop with sophisticated desoldering tools.

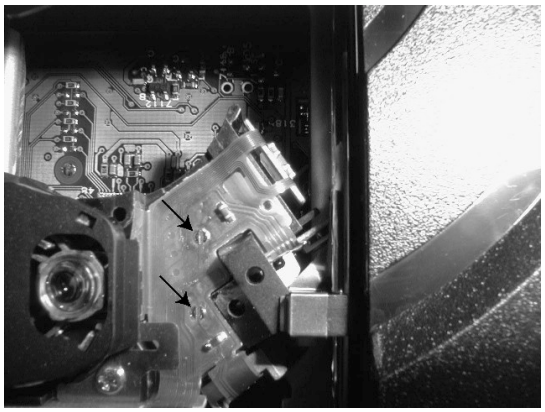


Figure 4-3 Solder joints

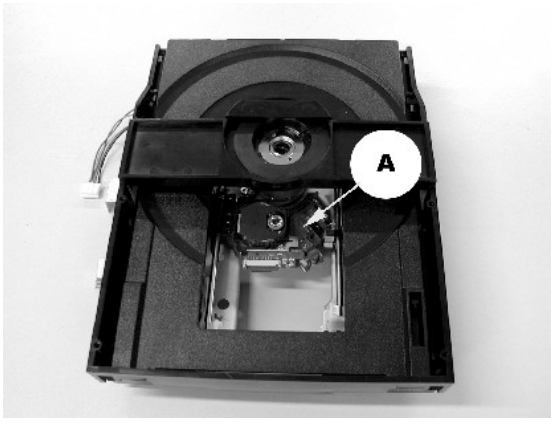


Figure 4-4 Solder joints

4.3.3 ComPair

For assistance with the repair process of the monoboard an electronic fault finding guidance has been developed. This program is called ComPair.
This ComPair program is available on CDROM.
The version of the CDROM for repair of the monoboard is V1.3 or higher and can be ordered with codenumber 4822 727 21637. This is an update CDROM, so when the ComPair CDROM is used for the first time, one has to install the ComPair Engine CDROM V1.2 first.
The V1.2 CDROM can be ordered with code number 4822 727 21634 and has to registered after instalation. The procedure for registration is explained in the help file of the program and in the CDROM booklet.
The cable to connect the monoboard with a PC can be ordered with codenumber: 3122 785 90017.
All the hardware and software requirements of the systems, necessary for working with ComPair, are described on the CDROM.

4.3.4 Service Positions

Refer to dismantling instructions for dismounting of the board. Figures 2-7 to 2-8 shows the service position that are recommended during repair of the boards.

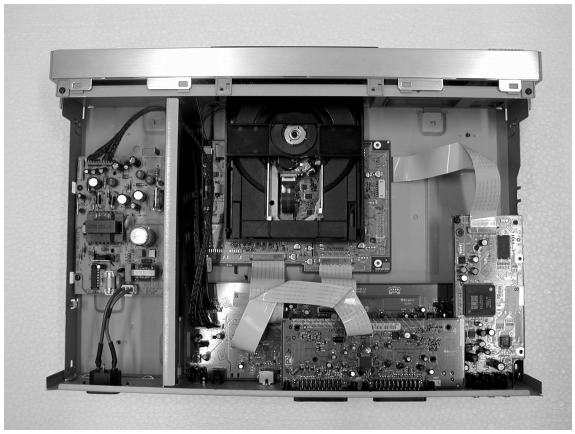


Figure 4-5 DVD963SA Layout

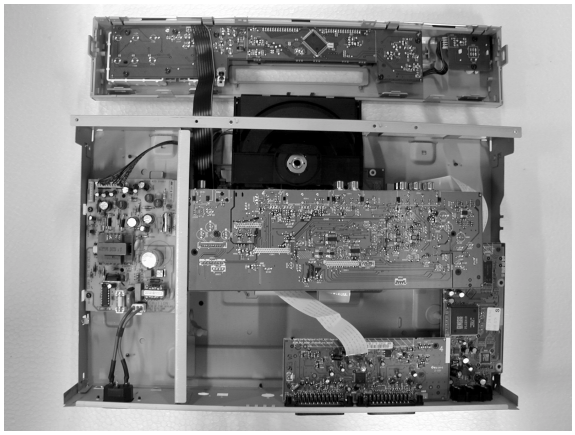


Figure 4-6 DVD963SA service manual

5. Diagnostic Software, Trouble Shooting and Test Instructions

5.1 Dealerscript

5.1.1 Purpose of Dealer Script

The dealer script can give a diagnosis on a standalone DVD player, no other equipment is needed to perform a number of hardware tests to check if the DVD player is faulty. The diagnosis is simply a "error" or "pass" message. No indication is given of faulty hardware modules. Only tests within the scope of the diagnostic software will be executed hence only faults within this scope can be detected.

5.1.2 Contents of Dealer Script

The dealer script executes all diagnostic nuclei that do not need any user interaction and are meaningful on a standalone DVD player.
The nuclei called in the dealer script are the following (the number after each nucleus name corresponds with the number being on the local display when the nucleus is executed during the dealer script):

Nucleus

Display Countdown	Nucleus Number	Nucleus Name	Description
7	6	PapChksFl	Calculate and verify checksum of FLASH memory
6	12	PapI2cDisp	Checks the I2C interface with the slave processor on the display board
5	13	PapS2bEcho	Checks the I2C interface to the basic engine
4	11	PapI2cNvram	Checks the I2C interface with the NVRAM
3	15	PapNvramWrR	Pattern test of all locations in the NVRAM
2	16	CompSdramWrR	Pattern test of all locations in the SDRAM(s)
1	63	FURORERSdramWrRLow	Pattern test of all locations in the SDRAM(s)

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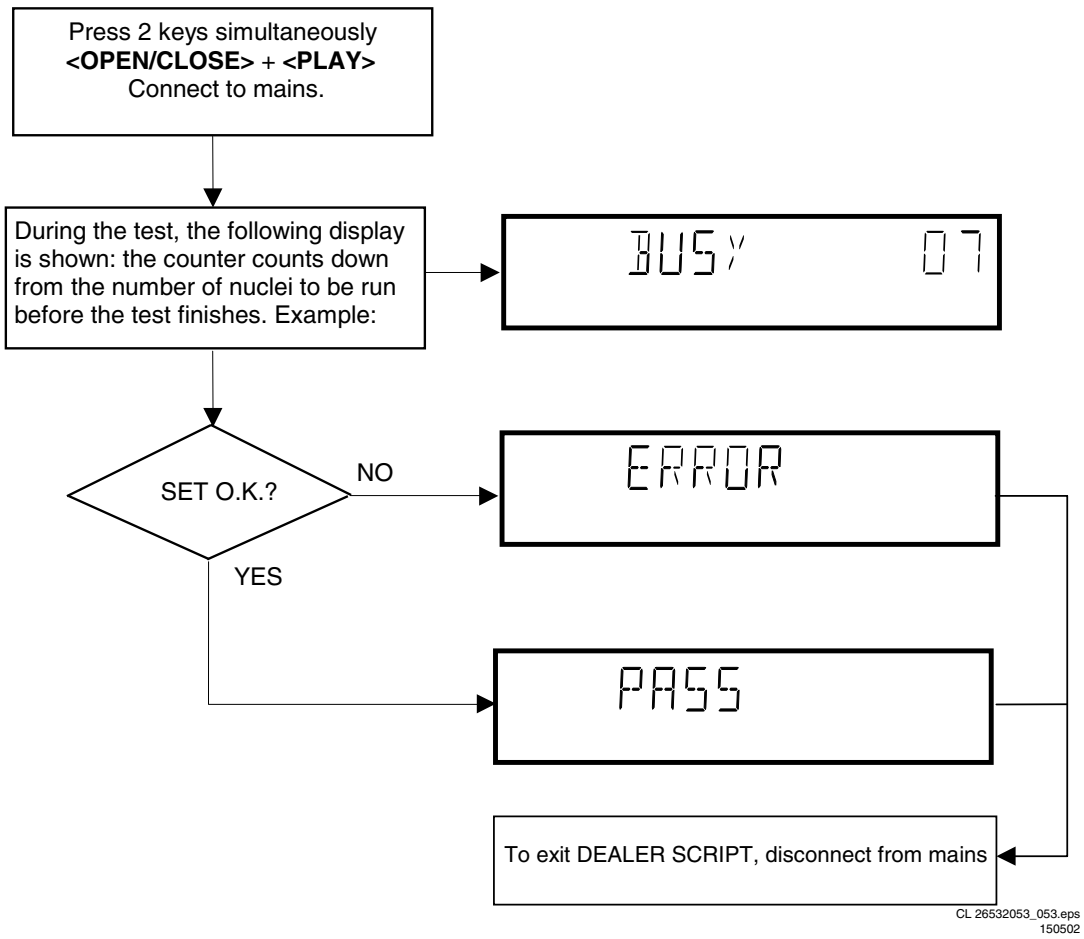
150502

Figure 5-1 Dealer script nuclei


Press 2 keys simultaneously
<OPEN/CLOSE> + <PLAY>
Connect to mains.
During the test, the following display is shown: the counter counts down from the number of nuclei to be run before the test finishes. Example:
BUSY 07
SET O.K.?
NO
ERROR
YES
PASS
To exit DEALER SCRIPT, disconnect from mains

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150502

Figure 5-2 Dealer Script

5.2 Player Script

5.2.1 Purpose of Player Script

The Player script will give the opportunity to perform a test that will determine which of the DVD player's modules are faulty, to read the error log and error bits and to perform an endurance loop test. To successfully perform the tests, the DVD player must be connected to a TV set to check the output of a number of nuclei. For DVDv2b a multi-channel amplifier, a set of 6 speakers and an external video source are necessary to test. To be able to check results of certain nuclei, the player script expects some interaction of the user (i.e. to approve a test picture or a test sound). Some nuclei (e.g. nuclei that test functionality of the Basic Engine module) require that the DVD player itself is opened, to enable the user to observe moving parts and approve their movement visually. Only tests within the scope of the diagnostic software will be executed hence only faults within this scope can be detected.

5.2.2 Contents of Player Script

The player script contains all nuclei that are useful on a DVD player that is connected to a TV set and help to determine which module of the DVD player is faulty, as well as to read out the contents of the error logs.

5.2.3 Structure of Player Script

The player script consists of a set of nuclei testing the three hardware modules in the DVD player: the Display PWB, the Digital PWB, and the Basic Engine.
Nuclei run by the player test need some user interaction. In the next paragraph this interaction is described. The player test is done in two phases:

1. **Interactive tests:** this part of the player test depends strongly on user interaction and input to determine nucleus results and to progress through the full test. Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player.
2. **The loop test**: this part of the player test will loop through the list of nuclei indefinitely, till the player is reset. The list of nuclei is as follows:
   - PapChksFlash
   - PapI2cNvram
   - CompSdramWrR
   - PapS2bEcho
   - PapI2cDisp

At the beginning of the tests, the DSW version number will be indicated on the local display of the DVD.
The display will look like the following:

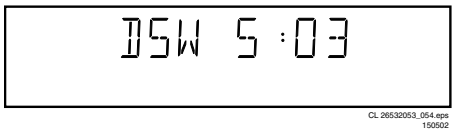

Figure 5-3

Pressing the PLAY key will proceed to the slave S/W version display, which is shown on the local display of the DVD player.
The display will look like the following:

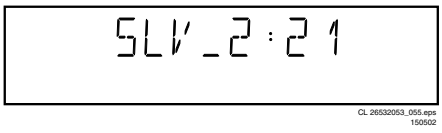

Figure 5-4

Press the OPEN/CLOSE key to proceed to the next test.

5.2.4 Survey

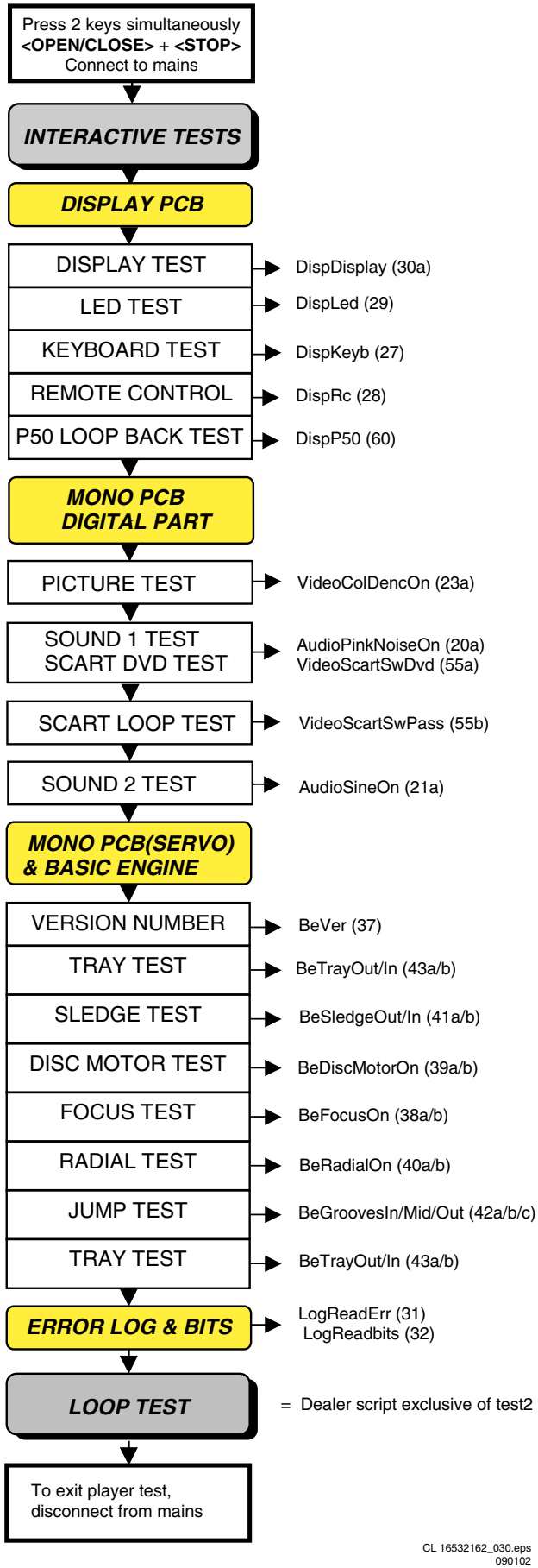

Figure 5-5

5.3 Display PCB

5.3.1 Display Test

The display test is performed by nucleus DispDisplay. By putting a serie of test patterns on the local display, the local display is tested. To step through all different patterns, the user must either press OPEN/CLOSE (pattern is ok) or STOP (pattern was incorrect) to proceed to the next pattern. The display of patterns is continued in a cyclic manner, shown in Fig. 5-6, until the user presses PLAY. If the user presses PLAY before all display patterns are tested, the DispDisplay nucleus will return FALSE (display test unsuccessful).

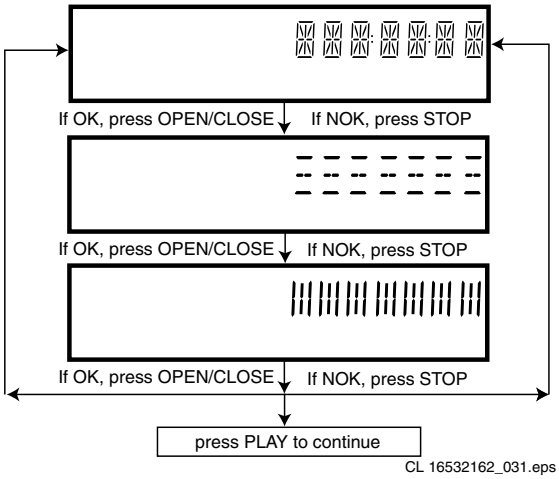

Figure 5-6

5.3.2 LED Test

The LED(s) on the DVD player is (are) tested by nucleus DispLed. The user must check if the LED(s) is (are) lighted; if it is, press OPEN/CLOSE, if it is not, press STOP. By pressing PLAY the script will proceed to the next test. If the user presses PLAY before OPEN/CLOSE or STOP, the DispLed nucleus will return TRUE (LED test successful).

5.3.3 Keyboard Test

The keyboard of the DVD player is tested by nucleus DispKeyb. The user is expected to press all keys on the local keyboard once. The code of the key pressed is shown on the local display (1 hexadecimal digit) immediately followed by a (hexadecimal) number indicating how many times that key has been pressed. Example of the local display during this test:

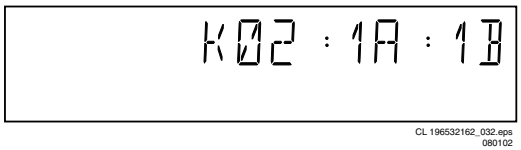

Figure 5-7

The key-codes displayed on the local display will scroll from right to left when the display gets full, the text "K" will remain on display.

KEY ID	KEY
0	PLAY
1	STOP
2	OPEN/CLOSE
3	STANDBY
4	NEXT
5	PREVIOUS
6	PAUSE
7	AUDIO DIRECT
E	SOUND MODE
F	REPEAT

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300802

Figure 5-8

If any keys are detected more than once (due to hardware error), the key-code is displayed twice (or more), with the second digit increased by 1.
If the user does not press all keys minimally once (in any order), the DispKeys nucleus will return FALSE and cause an error in the overall result of the player script.
The user can leave the keyboard test by pressing the PLAY key on the local display of the DVD player for at least one full second.
The result of the keyboard test is shown on local display as follows:

Figure 5-9

Or

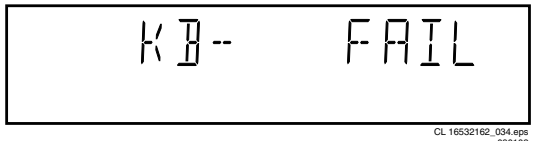

Figure 5-10

Pressing PLAY on the local keyboard again will proceed to the next text.

5.3.4 Remote Control Test

The remote control of the DVD player is tested by nucleus DispRc. The user must press any key on the remote control just once. The codes of the key pressed will be shown on the local display in hexadecimal format. Example:

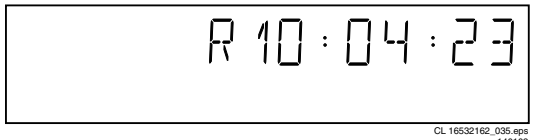

Figure 5-11

In this example 23 is the hexidecimal code of the pressed RC key. The user can leave the remote-control test by pressing PLAY on the local keyboard of the DVD player. The remote control test is successful if a code was received before the user

pressed the PLAY key. Pressing the PLAY key, before pressing a key on the remote control, gives an error in the remote control test (note that the remote control test will also fail if a key on the remote control was pressed but no code was received). The remote control test does not check upon the contents of the received code, that is it will not be checked if the received code matches the key pressed. If desired, the user can manually check this code by using a code-table for the remote control key-codes.

RC Key id	Hexadecimal code
STANDBY	0C
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0
RETURN	83
DISPLAY	EF
DISC MENU	54
SYSTEM MENU	82
CURSOR UP	58
CURSOR DOWN	59
CURSOR LEFT	5A
CURSOR RIGHT	5B
OK	5C
PREVIOUS	21
NEXT	20
STOP	31
PLAY	2C
PAUSE	30
SUBTITLE	4B
ANGLE	85
ZOOM	F7
AUDIO	4E
REPEAT	1D
REPEAT A-B	3B
SHUFFLE	1C
SCAN	2A

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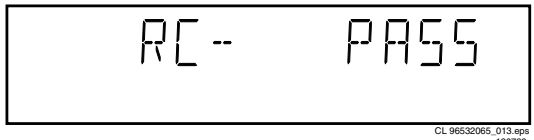
080102

Figure 5-12

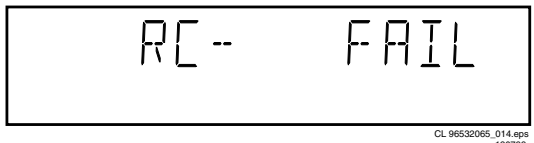
After pressing PLAY, the result of the remote control test is displayed on the local display of the DVD player as follows:



CL 96532065_013.eps
120799

Figure 5-13

Or



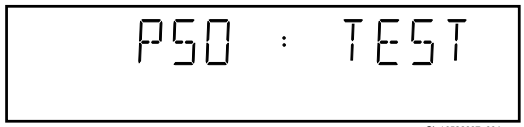
CL 96532065_014.eps
120799

Figure 5-14

Pressing PLAY on the local keyboard again will proceed to the next test.

5.3.5 P50 Loop-Back Test

For the P50 loop-back test, the user must first press a key to decide if the test is to be performed.
The display will show the following message:

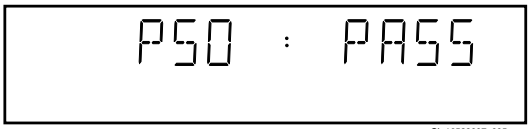


CL 16532007_004.eps
090102

Figure 5-15

If the user presses STOP, the P50 test will be skipped.
If the user presses OPEN/CLOSE, the P50 test is performed and the result is displayed as follows:

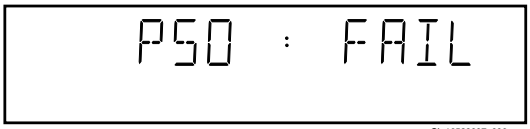
Test successful:



CL 16532007_005.eps
090102

Figure 5-16

Test fails:



CL 16532007_006.eps
090102

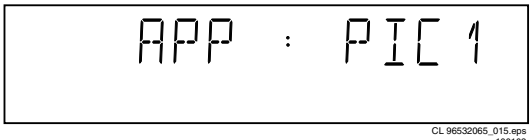
Figure 5-17

Press the PLAY key to continue to the next text

5.4 Mono PCB Digital Part

5.4.1 Picture Test

The picture test is performed by putting a predefined picture (colour bar) on the display (nucleus VideoColDencOn), and asking the user for confirmation.
The display will show the following message:



CL 96532065_015.eps
100102

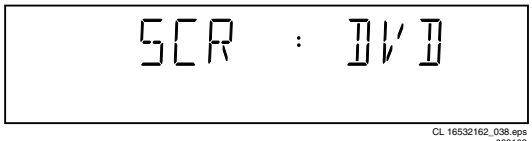
Figure 5-18

By pressing OPEN/CLOSE the user confirms the test, pressing STOP will indicate the picture was invisible or incorrect. Pressing PLAY will proceed to the next test. If the user presses PLAY without pressing OPEN/CLOSE or STOP first, the result of this test will be TRUE (picture ok).

Note: The colour bar must be simultaneously available on the CVBS, YC, and RGB (or YUV) outputs available. On the SCART only the CVBS and RGB signals will be available.

5.4.2 Sound 1 & SCART DVD Test

The first soundtest is performed by starting a pink noise sound that needs confirmation from the user (nucleus AudioPinkNoiseOn).
The display will show the following message:

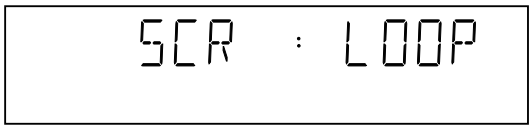


CL 16532162_038.eps
080102

Figure 5-19

On the TV screen a colour bar (generated by nucleus VideoColDencOn) is visible and the internally generated pinknoise is audible.
By pressing the PLAY key, the user confirms the test. Pressing the STOP key will indicate the sound was inaudible or incorrect.

Note: Only for double scart models, SCART loop-through will be simultaneously active during this test. SCART loop-through will be measured with the aid of an external video source.
By pressing the PLAY key, there will be switched over to the external source. This must become now visible on the TV srcreen (using the SCART).
The local display will show the following message:



CL 16532162_039.eps
080102

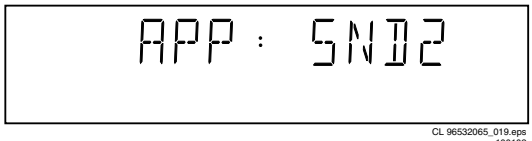
Figure 5-20

The internally generated colour bar is still available on the CVBS and Y/C outputs. And the pinknoise-signal is still available on the cinch audio outputs. By pressing the OPEN/CLOSE button, the internal generated colour bar becomes visual again.

The test can be left by pressing the PLAY key for more than one second.

5.4.3 Sound 2 Test

The second soundtest is performed by producing a sine sound (nucleus AudioSineOn). The signal can be stopped by pressing the STOP key.
The display will show the following message:



CL 96532065_019.eps
100102

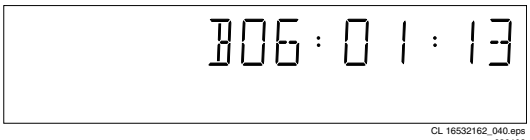
Figure 5-21

After the audio signal has been stopped, by pressing OPEN/CLOSE, the user confirms the test. Pressing STOP will indicate that something went wrong. Pressing PLAY will proceed to the next. If the user presses PLAY without pressing OPEN/CLOSE or STOP first, the result of this test will be TRUE (sound ok).

5.5 Basic Engine

5.5.1 Version Number

In the basic engine tests, the version number of the Basic Engine will be shown first, as the following example:



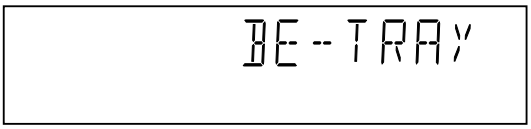
CL 16532162_040.eps
080102

Figure 5-22

By pressing the PLAY key, the Basic Engine tests are started.

5.5.2 Tray Test

First, the tray is tested. The purpose of this test is also to give the user the opportunity to put a disc in the tray of the DVD player. Some tests on the Basic Engine require that a disc (e.g. DVD MPTD test disc) is present in the player. At the end of the Basic Engine tests this tray test will be repeated solely to enable the user to remove the disc in the tray.
The local display will look as follows:



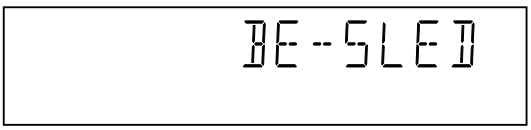
CL 16532162_041.eps
080102

Figure 5-23

By pressing OPEN/CLOSE the user can toggle the position of the tray. Note that this test will not contribute to the test result of the Basic Engine. Pressing PLAY will proceed to the next test. At this point, the tray will be closed automatically by the software if it was open.

5.5.3 Sledge Test (Visual Test)

The second Basic Engine test tests the sledge. The user can move the sledge as many times as desired by using OPEN/CLOSE (nucleus BeSledgeOut) and STOP (nucleus BeSledgeIn). Pressing PLAY on the local keyboard proceeds to the next test. Note that this test will not contribute to the test result of the Basic Engine.
The local display will look as follows during the sledge test:

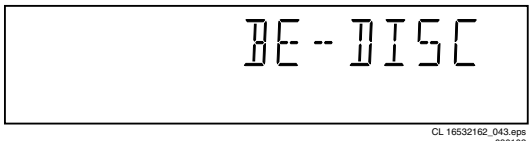


CL 16532162_042.eps
080102

Figure 5-24

5.5.4 Disc Motor Test (Visual Test)

The third Basic Engine test tests the disc motor (nucleus BeDiscMotorOn).
The local display looks as follows:



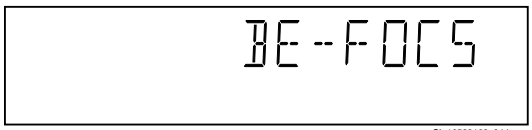
CL 16532162_043.eps
080102

Figure 5-25

By pressing OPEN/CLOSE the user confirms that the disc motor is running. Pressing STOP indicates the disc motor does not work. Pressing PLAY proceeds to the next test, after a reset of the disc motor (nucleus BeDiscMotorOff). If the user presses PLAY before pressing OPEN/CLOSE or STOP, the result of this test will be TRUE (disc motor is running).

5.5.5 Focus Test (Visual Test)

The fourth Basic Engine test tests the focussing. First focussing is turned on by calling nucleus BeFocusOn.
The display will look as follows:



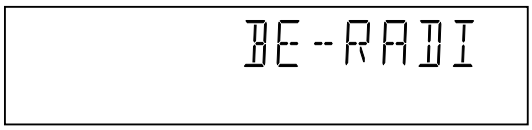
CL 16532162_044.eps
080102

Figure 5-26

By pressing OPEN/CLOSE the user confirms that the focussing was succesful. Pressing STOP indicates a focussing failure. Pressing PLAY proceeds to the next test after a reset of the focussing (nucleus BeFocusOff). If PLAY is pressed before OPEN/CLOSE or STOP, the result of this test will be TRUE (focus successful).

5.5.6 Radial Test (Visual & Listening Test)

The fifth Basic Engine test tests the radial functionality (nucleus BeRadialOn).
The local display looks as follows:



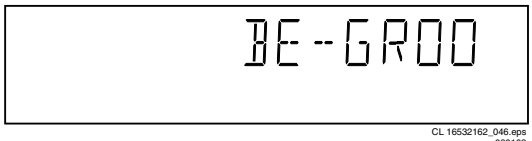
CL 16532162_045.eps
080102

Figure 5-27

By pressing OPEN/CLOSE the user confirms that the radial function works.Pressing STOP indicates the function does not work. Pressing PLAY proceeds to the next test, after a reset of the radial (nucleus BeRadialOff). If the user presses PLAY before pressing OPEN/CLOSE or STOP, the result of this test will be TRUE (radial successful).

5.5.7 Jump Test (Listening Test)

The sixth and last Basic Engine test tests the jumping by calling nuclei BeGroovesIn, BeGroovesMid and BeGroovesOut.
During this test, the local display looks as follows:



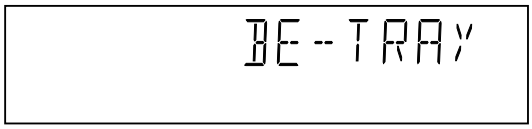
CL 16532162_046.eps
080102

Figure 5-28

The user can switch between the three different types of groove settings by pressing OPEN/CLOSE (forward to next nucleus in the list In-Mid-Out), or STOP (backward in the list In-Mid-Out). This is done in a cyclic manner; note that this test will not contribute to the test result of the Basic Engine. Pressing PLAY proceeds to the next test, after the disc motor has been shut off with a call to nucleus BeDiscMotorOff.

5.5.8 Tray Test

As a last action for the Basic Engine tests, the tray test is repeated. The local display will look as follows:



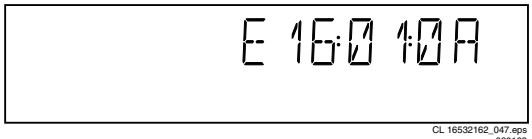
CL 16532162_041.eps
080102

Figure 5-29

This test is meant to give the user the opportunity to remove the disc in the tray. The tray position can be toggled using the OPEN/CLOSE key. The tray will be closed (by the software, if it is open) before proceeding to the next test when the user presses the PLAY key.

5.5.9 Error Log (See Table on Page 25)

Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player. Reading the error log is done by nucleus LogReadErr.
The display during the errorlog readout looks as follows :



CL 16532162_047.eps
080102

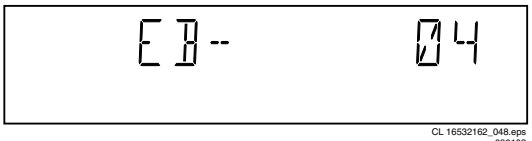
Figure 5-30

Note: Previous versions of the diagnostic software showed a 8-digit error code.
Due to limitations in the number of digits that can be displayed by some front panel displays, the most significant digits will not be shown. This can be done since all the error codes used by this player has set these 2 digits to “00”

By pressing OPEN/CLOSE or STOP the user can move forward or backward (respectively) through the logged error codes. If "0000" is displayed at all positions, the error log is empty. Display of the logged errors is done in a cyclic manner. By pressing PLAY on the local keyboard, the user can proceed to the next test.

5.5.10 Error Bits

Reading the error bits is done by nucleus LogReadBits. The display during the errorbits readout looks as follows:



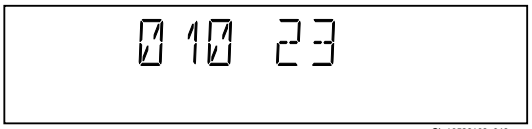
CL 16532162_048.eps
080102

Figure 5-31

Only the identification number (decimal) representing set errorbits will be shown. By pressing OPEN/CLOSE or STOP, the user can move forward or backward (respectively) through the logged errorcodes. If the display only shows "EB-0", no error bits were set. By pressing PLAY the user can continue to the next test.

5.6 Loop Test (See Table Below)

At the start of the loop test, the local display of the DVD player will show the interactive player test result readout in the following display:



CL 16532162_049.eps
080102

Figure 5-32

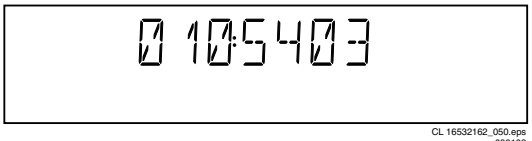
The left side of the display contains a 3-digit code, which can have a value between 000 and 111. These values indicate the faulty modules and are to be interpreted as follows:

Displayed Value	Indication for each module		
	Basic Engine	Mono PCB	Display PCB
000	ok	ok	ok
001	ok	ok	faulty
010	ok	faulty	ok
011	ok	faulty	faulty
100	faulty	ok	ok
101	faulty	ok	faulty
110	faulty	faulty	ok
111	faulty	faulty	faulty

CL 96532065_031.eps
120799

Figure 5-33

The loop test will perform the same nuclei as the dealer test, but it will loop through the list of nuclei indefinitely. The display of the DVD player will display not only the three digits indicating correct/faulty modules and the last found error code (as mentioned, faults are detected as far as they can be within the scope of the diagnostic software), but also a loop counter indicating how many times the loop has been gone through. If an error was detected, the display will remain as in figure 5-34 until the user presses the PLAY key and then it will continue to the next loop.
Example:



CL 16532162_050.eps
080102

Figure 5-34

The 2-digit number (23) on the right of figure 5-32 indicates the number of times the loop test has been performed.

After one loop cycle: Display the 3-digit module bits together with the last error code which occured in the loop test. The 4 digits at the right side of the display (fig. 5-34) show the last error that was found during the loop test. The leftmost two digits (54) of this code indicates which nucleus resulted in a fault. The rightmost two digits (03) refer to the faultcode within that nucleus. For further explanation of this error code, refer to chapter 5.8 (Nuclei Error Codes).

5.6.1 Errorlog

Explanation:
The application errors will be logged in the NVRAM. The maximum number of error bytes that will be visible is 16. The first word (4 digits) of the byte is the component identification, the last word is the error code.
The diagnostics software will present a combination of this component identification plus an error code on the local display (and on the attached terminal). The last reported error is shown as < 00000000, the oldest visible error as 00000000 > and the errors in between as < 00000000 >.
The devices that may report errors are the serial controller (UART), the basic engine (BE), the slave processor (SLPH), the SACD Stream Manager (SSM) and the SACD Media Access (SMA). The identification of these components is as follows:

Component name	Component identification
Serial controller (UART)	000A
Engine (BE)	0016
Slave Processor (SLPH)	001A
SACD Stream Manager (SSM)	001C
SACD Media Access (SMA)	002E
Diagnostic software (DS)	Dxxx

The tables in the next chapters list the error code and corresponding problem. The column 'Explanation' holds a more elaborate description and the most likely reason for the error.

Some Examples:
002E0000 (SMA reported a timeout error)
0016010A (Engine could not fully close or open the tray)
D0010001 (Flash checksum failed).

For further explanation of DS errors, see description of nucleui error codes in paragraph 5.8.

UART Error Codes

Error Number	Error name	Explanation
0000	BUF_OVERFLOW	To many characters were offered in too little time. Reason: system was too busy doing other jobs.
0001	COMMUNICATION	Usually a protocol error. Reason: bad connection between engine and processor.
0002	TIME OUT	

BE Errors

Error Number	Error name	Explanation
0101	S2B_ILL_COMMAND	Parameter(s) not valid for this command. Reason: some communication problem between UART and engine.
0102	S2B_ILL_PARAM	Command not allowed in this state or unknown. Reason: see S2B_ILL_COMMAND error
0103	S2B_SLEDGE	Sledge could not be moved to home position.
0104	S2B_FOCUS	Focus failure
0105	S2B_MOTOR	Motor could not reach speed within timeout
0106	S2B_RADIAL	Servo didn't get on track after several retries.
0107	S2B_PLL_LOCK	PLL could not lock in Accessing or Tracking state
0108	SBC_HEADER_TO	Header timeout
0109	S2B_SBC_NOT_FOUND	Requested subcode item could not be found.
010A	S2B_TRAY	Tray could not be opened or closed completely.
010B	S2B_TOC_READ	TOC could not be read within timeout period.
010C	S2B_JUMP	Requested seek could not be performed.
010D	S2B_NON_EXIST_SES	Attempt to access a non-existing session.
010E	S2B_NON_EXIST_BCA	Caller tries to acces a non-existing BCA area
010F	Speed setting	A wrong or inappropraiate speed value has been set
0116	NO_DISC	No disc selected
011A	TRAY_INIT	After reset, initialized tray
011B	NO TOC INFO	No TOC information in lead-in area or erase TOC found
01F0	S2B_OVERRUN	Too many bytes received over S2B Reason: see S2B_ILL_COMMAND error
01F1	S2B_COMM_TO	Not enough bytes are received over S2B Reason: see S2B_ILL_COMMAND error
01F2	S2B_PARITY	Byte received with parity error. Reason: see S2B_ILL_COMMAND error
01F3	S2B_ILL_PHASE	CMD IDC is not valid, transmission out of sync. Reason: see S2B_ILL_COMMAND error
01F4	S2B_ILL_NR_OF_BYTES	Byte count has an illegal value. Reason: see S2B_ILL_COMMAND error

SLPH Error Codes

Error Number	Error name	Explanation
0000	COMMUNICATION	Error in I2C communication. Reason: bad connection between slave processor and main processor.

SSM Error Codes

Error Code	Error name	Explanation
0006	SP_SYNCERROR	System cannot get synchronised with sectors coming from disc. Reason: Usually a damaged disc or the player was dropped/ pushed during operation. If not, the engine is malfunctioning.
0007	SP_EDCERROR	Data coming from disc is damaged. Reason: see SP_SYNCERROR

Error Code	Error name	Explanation
0008	SP_CONTINUITYERROR	Sequence of sectors coming from disc is incorrect. Reason: see SP_SYNCERROR
0009	DMX_CONTINUITYERROR	Sequence of sectors is incorrect. Reason: problem with buffer RAM
000A	LLD_ERROR	An illegal audio format was offered to the decoder. Reason: unknown audio type on disc or problem with buffer RAM
000B	BCU_ERROR	Internal problem in Furore chip

SMA Error Codes

Error Number	Error name	Explanation
0000	SMA_TIMEOUTERROR	Data coming from disc not in time. Reason: damaged disc or engine problem.

5.6.2 Reprogramming of New Mono Boards.

Caution

This information is confidential and may not be distributed. Only a qualified service person should reprogram the mono board.

After reset of NV-memory or repair of the mono board, all the customer settings and also the region code will be lost.
Reprogramming of the mono board will put the player back in the state in which it has left the factory, i.e. with the default settings and the allowed region code.
Reprogramming is limited to 25 times
When the counter reaches 25, reprogramming is not possible anymore
Reprogramming will be done by way of the remote control.
Put the player in stop mode, no disc loaded.
Press the following keys on the remote control:
<***PLAY***> followed by numerical keys ***<1> <5> <9>***
The display shows: "***- - - - - - - - - - -***"
Press now successively the following keys :

for DVD963SA /001 : ***<2><2><2> <0><1><2><0><0>***
for DVD963SA 171 : ***<1><1><1> <0><1><0><0><0>***
for DVD963SA 691 : ***<3><2><3> <0><1><0><0><0>***

Press <***PLAY***> again.
The TV screen will become BLUE during a short time to confirm that the mono board has been reprogrammed.

CL 26532105_053.eps
280802

Figure 5-35 Reprogamming code

5.6.3 Trade Mode

When the player is in Trade Mode, the player cannot be controlled by means of the front key buttons, but only by means of the remote control.

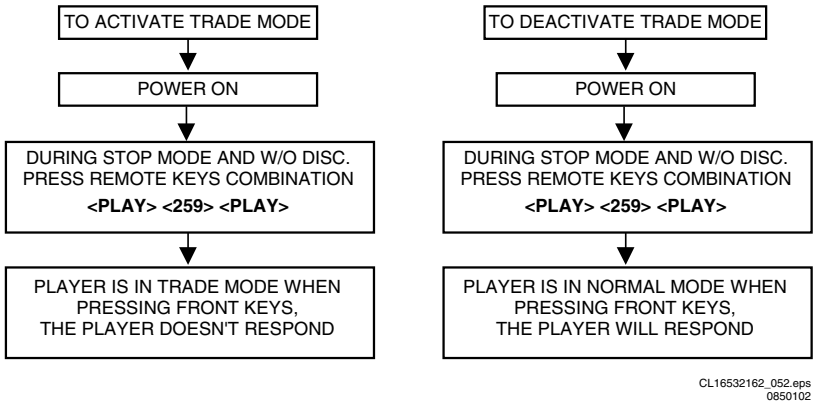


Figure 5-36

Note: To activate and deactivate the Trade Mode with the disc in the player, the procedure is similar to above, except that the remote control keys combination is pressed at the instant when the local display is flashing “READING”

5.7 Menu and Command Mode Interface

5.7.1 Layout of Results Diagnostic Nuclei

Results returned from a Diagnostic Nucleus will be displayed in the following layout:
< number >< string > [ok | ER]

< number >: is a 4-digit decimal number padded with leading zeros if its value is less than 4 digits. The first 2 digits identify the generating nucleus (or group of nuclei) while the latter 2 digits indicate the error number.

< string >: is a text string containing information about the result of the Diagnostic Nucleus.

< number > and < string > are defined in [SSD_DN] in the output sections of each Nucleus.

Examples:
1. 0001Unknown command ER @
2. 3100OK @
3. 0901Data line X is not connected to the DRAM ER@

5.7.2 Command Mode Interface

Set-up Physical Interface Components
Hardware required:
- Service PC
- one free COM port on the Service PC
- special cable to connect DVD player to Service PC

The service PC must have a terminal emulation program (e.g. OS2 WarpTerminal or Procomm) installed and must have a free COM port (e.g. COM1). Activate the terminal emulation program and check that the port settings for the free COM port are: 19200 bps, 8 data bits, no parity, 1 stop bit and no flow control. The free COM port must be connected via a special cable to the RS232 port of the DVD player. This special cable will also connect the test pin, which is available on the connector, to ground (i.e. activate test pin).
Code number of PC interface cable: 3122 785 90017

Activation
Switch the player on and the following text will appear on the screen of the terminal (program):

```
DVDv4 Diagnostic Software version 5.03

(M)enu, (C)ommand or (S)2B interface ? [M]:@ C <enter>

SDRAM Interconnection test passed
Basic SDRAM test passed
Slave Processor: SLAVE2

DD:>                                                    CL 26532105_058.eps
                                                                  020902
```

Figure 5-37

The first line indicates that the Diagnostic software has been activated and contains the version number. The second line lets the user choose the interface format. Enter ‘C’ to select Command Mode and the next three lines are the successful result of the two subsequent basic tests (nuclei 2, ,4 and the detection of the display type used by the panel respectively). If not all these messages appear on the terminal screen, then the related nucleus found an error. The last line is the prompt ("DD>"). The diagnostic software is now ready to receive commands.

Command Overview of Nuclei
The following table gives an overview of all available nuclei. The first column contains an identification number, the second contains the name of a nucleus and the last column indicate the description of the nucleus.

Note: User confirmation is necessary during front panel tests

Table 5-1 Basic diagnostic nuclei

Ref. #	Reference Name	Remark
1	BasicSpAcc	Serial port Access test/ initialization
2a	BasicInterconDram	Data and address bus Interconnection (only for development)
2b	BasicInterconSdram	Data and address bus interconnection
3	BasicDramWrR	DRAM Write Read (only for development)
4	BasicSdramWrR	SDRAM Write Read

Table 5-2 Processor and peripherals

Ref. #	Reference Name	Remark
6	PapChksFl	Checksum FLASH
7a	PapUclkAclkCdda	uClock A_CLK in CD-DA mode
7b	PapUclkAclkDvd	uClock A_CLK in DVD mode
7c	PapUclkAclkDvd96	uClock A_CLK in DVD (96kHz) mode
10	PapFlashWrAcc	FLASH Write Access (only for development)
11	PapI2cNvram	I2C NVRAM access
12	PapI2cDisp	I2C Display PWB
13	PapS2bEcho	S2B Echo
14	PapS2bPass	S2B Pass-through
15	PapNvramWrR	NVRAM Write Read
62	PapChksSum	Show checksums stored in flash

Table 5-3 Components

Ref. #	Reference Name	Remark
16	CompSdramWrR	SDRAM Write Read

Table 5-4 Audio

Ref. #	Reference Name	Remark
19a	AudioMuteOn	Audio Mute On
19b	AudioMuteOff	Audio Mute Off
20a	AudioPinkNoiseOn	Audio Pinknoise On
20b	AudioPinkNoiseOff	Audio Pinknoise (or beep tone) Off
20c	AudioBeepToneOn	Audio Beep Tone On
21a	AudioSineOn	Audio Sine signal On/Off
21b	AudioSineBurst	Audio Sine signal Burst
56a	AudioLfePortHigh	Set the LFE_SEL port to HIGH
56b	AudioLfePortLow	Set the LFE_SEL port to LOW
65	DAC_I2C	Resets DAC and check I2C communication with DAC
66a	DAC_I2CEnable	Enable I2C communication to AV board
66b	DAC_I2CDisable	Disable I2C communication to AV board
67a	DAC_ClockInternal	Uses internal clock from monoboard for DAC (256fs)
67b	DAC_ClockExternal	Uses external clock for DAC (384fs)
68a	DAC_AudioPreMuteOn	Enable Audio Pre-mute pin
68b	DAC_AudioPreMuteOff	Disable Audio Pre-mute pin
69a	DAC_CenterOn	Enable Center on pin
69b	DAC_CenterOff	Disable Center on pin
79	DAC_Reset	Resets DAC
80a	DAC_ModeCDDA	Sets DAC to CDDA mode
80b	DAC_ModeDVD48	Sets DAC to DVD mode (48kHz)
80c	DAC_ModeDVD96	Sets DAC to DVD mode (96kHz)
80d	DAC_ModeDSD	Sets DAC to DSD mode
81a	DAC_LowPowerStandbyOn	Enable Low Power Standby
81b	DAC_LowPowerStandbyOff	Disable Low Power Standby
82a	DAC_UpsamplingFreq192k	Sets Upsampling frequency to 192kHz
82b	DAC_UpsamplingFreq96k	Sets Upsampling frequency to 96kHz
82c	DAC_UpsamplingOn	Enable upsampling
82d	DAC_UpsamplingOff	Disable upsampling

Table 5-5 Video

Ref. #	Reference Name	Remark
17a	VidPortOutAA	Output the value 0XAA at the Digital Video Interface Port
17b	VidPortOut55	Output the value 0X55 at the Digital Video Interface Port
23a	VideoColDencOnPAL	Colourbar (PAL) DENC On
23b	VideoColDencOff	Colourbar DENC Off
23c	VideoColDencOnNTSC	Colourbar (NTSC) DENC On
24a	VideoProgMPEGon	Progressive - DigitalVideo Colour Bar ON
24b	VideoYuvMPEGon	Enhanced YUV-DigitalVideo Colour Bar
25a	VideoScartLo	Scart Low
25b	VideoScartMi	Scart Medium
25c	VideoScartHi	Scart High
54	VideoScartSwComm	Scart Switch communication
55a	VideoScartSwDvd	Scart Switch Dvd
55b	VideoScartSwPass	Scart Switch Pass-through
57a	VideoScartPinLo	PIO-pins as used in 2A for Scart-switching
57b	VideoScartPinMi	PIO-pins as used in 2A for Scart-switching
57c	VideoScartPinHi	PIO-pins as used in 2A for Scart-switching
61a	VideoColOutRGB (ST5508)	Output RGB from ST5508
61b	VideoColOutYUV (ST5508)	Output YUV from ST5508

Table 5-6 Display (slave processor)

Ref. #	Reference Name	Remark
26	DispVer	Version number
27	DispKeyb	Keyboard
28	DispRc	Remote Control
29	DispLed	LEDs
30a	DispDisplay	VFT Display test
30b	DispLCDisplay	LCD Display test
30c	DispLCDBkLight	LCD Backlight test
60	DispP50	P50 loopback test

Table 5-7 Log (Error logging in Nvram)

Ref. #	Reference Name	Remark
31	LogReadErr	Read last Errors
32	LogReadBits	Read errors Bits
33	LogReset	Reset

Table 5-8 Miscellaneous

Ref. #	Reference Name	Remark
34	MiscReadConfig	Read Configuration area from NVRAM
35	MiscNvramReset	NVRAM Reset
36	MiscNvramMod	Modify NVRAM contents
46	MiscApplVer	Read version of application software
47a	MiscTrayOpenNr	Read the number of times the tray opened
47b	MiscPowerOnTime	Read the total time the player's power has been on
47c	MiscPlayTimeCddaVcd	Read the Playtime of CDDA and VCD discs
47d	MiscPlayTimeDvd	Read the Playtime of DVD discs

Table 5-9 Basic engine

Ref. #	Reference Name	Remark
37	BeVer	Version number
38a	BeFocusOn	Focus On
38b	BeFocusOff	Focus Off
39a	BeDiscmotorOn	Discmotor On
39b	BeDiscmotorOff	Discmotor Off
40a	BeRadialOn	Radial control On
40b	BeRadialOff	Radial control Off
41a	BeSledgeIn	Sledge Inwards
41b	BeSledgeOut	Sledge Outwards
42a	BeGroovesIn	jump Grooves to Inside
42b	BeGroovesMid	jump Grooves to Middle
42c	BeGroovesOut	jump Grooves to Outside
43a	BeTrayIn	Tray In
43b	BeTrayOut	Tray Out
44	BeReset	Reset Basic Engine
58a	LaserCdOn	CD Laser on
58b	LaserCdOff	CD Laser off
58c	LaserDvdOn	DVD Laser on
58d	LaserDvdOff	DVD Laser off
70	BedReadFlashID	Read flash memory manufacturer and device ID
71	BedCalcRomChksum	Calculate ROM checksum
72	BedScratchTest	Test scratch detection circuit

Table 5-10 Furore IC

Ref. #	Reference Name	Remark
62	Furore_SdramWrR	Furore SDRAM Write Read test
63	Furore_SdramWrR Fast	Furore SDRAM interconnection test
64	Furore_Id	Furore version ID check
83	Furore_Reset	Furore reset
84a	Furore_High	Sets Furore output pins DSD_PCM0-9 to high
84b	Furore_Low	Sets Furore output pins DSD_PCM0-9 to low

Table 5-11 Karaoke (not available)

Ref. #	Reference Name	Remark
48a	KaraokeModeOff	Switch Karaoke mode off
48b	KaraokeModeOn	Switch Karaoke mode on
49	KaraokeMicInput	Check path from the microphone input to audio output
50a	KaraokeKeyOn	Set Karaoke Key to the maximum level (1200 cent)
50b	KaraokeKeyOff	Set Karaoke Key to flat octave (0 cent)
51a	KaraokeEchoOn	Set Echo Control fuction on
51b	KaraokeEchoOff	Set Echo Control function off

5.7.3 Menu Mode Interface

Activation
Switch the player on and the following text will appear on the screen of the terminal (program):

```
DVDv4 Diagnostic Software version 5.03


(M)enu, (C)ommand or (S)2B interface ? [M]:@ <enter>
SDRAM Interconnection test passed
Basic SDRAM test passed
Slave Processor: SLAVE2



Press ENTER to go to main menu
CC: > <enter>

MAIN MENU
1. Audio ...
2. Video ...
3. Front Panel ...
4. Basic Engine ...
5. Processor Peripherals ...
6. Error Log ...
7. Furore ...
8. Miscellaneous ...

Select >                                  CL 26532105_059.eps
                                                  020902
```

Figure 5-38 Screen menu

The first line indicates that the Diagnostic software has been activated and contains the version number. The next lines are the successful result of the SDRAM interconnection test and the basic SDRAM test. The last line allows the user to choose between the four possible interface forms. If pressing M has made a choice for Menu Interface, the Main Menu will appear.

Layout of Menu and Submenu
The following menu layout will appear after starting up the DVD player in menu mode. The symbol "- - -"" indicates that the current menu choice will invoke the display of a submenu. The number between [ ] idicates the nucleus number. These numbers will not be shown on the screen.

Menus

MAIN MENU
1 Audio...
2 Video...
3 Front Panel...

4 Basic Engine...
5 Processor Peripherals...
6 Error Log...
7 Furore...
8 Miscellaneous...

First Level Submenus

MAIN > AUDIO MENU
1 Mute...
2 Pink Noise...
3 Sine Wave...
4 Digital Ports...
5 Ext. DAC Board...

MAIN > VIDEO MENU
1 Colourbar...
2 Scart...
3 Digital Port...

MAIN > FRONT PANEL MENU
1 Slave Processor...
2 VFT Display [30a]
3 LCD Display [30b]
4 LCD BkLight [30c]
5 Keyboard [27]
6 LEDs [29]
7 Remote Control [28]
8 P50 Check [60]

MAIN > BASIC ENGINE MENU
1 Reset [44]
2 Version [37]
3 S2B...
4 Loader Mechanism...
5 Special Diagnostics...

MAIN > PROCESSOR PERIPHERALS MENU
1 Clock...
2 Flash...
3 NVRAM...
4 SDRAM Write/Read [16]

MAIN > ERROR LOG MENU
1 Read Last Errors [31]
2 Read Error Bits [32]
3 Reset Error Log [33]

MAIN > FURORE MENU
1 SDRAM Write/Read [63]
2 SDRAM Write/Read [64]
3 Chip Revision ID [65]
4 Set Output High [84a]
5 Set Output Low [84b]
6 Reset [83]

MAIN > MISCELLANEOUS MENU
1 Statistics Info...
2 Read DVD Application version [46]

Second Level Submenus

MAIN > AUDIO > MUTE MENU
1 Mute On [19a]
2 Mute Off [19b]

MAIN > AUDIO > PINK NOISE MENU
1 Pink Noise On [20a]
2 Pink Noise / Beep Tone Off [20b]
3 Beep Tone On [20c]

MAIN > AUDIO > SINE WAVE MENU
1 Audio Sine On [21a]
2 Audio Burst On [21b]

MAIN > AUDIO > DIGITAL PORTS MENU
1 LFE_SEL High [56a]
2 LFE_SEL Low [56b]

MAIN > AUDIO > EXT DAC BOARD MENU
1. DAC Reset [79]
2. I2C Test...
3. Clock...
4. Audio...
5. Low Power Standby...
6. DAC Mode...

MAIN > VIDEO > COLOURBAR MENU
1 Colourbar DENC On (PAL) [23a]
2 Colourbar DENC On (NTSC) [23c]
3 Colourbar DENC/MPEG Off [23b]
4 ProgressiveScan MPEG On [24a]
5 Enhanced YUV MPEG On [24b]
6 Set Video Out To RGB [61a]
7 Set Video Out To YUV [61b]

MAIN > VIDEO > SCART MENU
1 I2C Scart IC Check [54]
2 Scart To DVD [55a]
3 Scart Pass Through [55b]
4 Scart Pin 8 Low (0 to 2)V [25a]
5 Scart Pin 8 Mid (4.5 to 7)V [25b]
6 Scart Pin 8 Hi(9.5 to 12)V [25c]

MAIN > VIDEO > DIGITAL PORT MENU
1 Video Port Out 0xAA [17a]
2 Video Port Out 0x55 [17b]

MAIN > FRONT PANEL > SLAVE PROCESSOR MENU
1 Bus Comms Check [12]
2 S/W Version [26]

MAIN > BASIC ENGINE > S2B MENU
1 S2B Echo [13]
2 S2B Pass-Through [14]

MAIN > BASIC ENGINE > MECHANISM MENU
1 Disc Motor...
2 Laser...
3 Tray...
4 Focus...
5 Radial...
6 Sledge...
7 Grooves...

MAIN > BASIC ENGINE > SPECIAL DIAGNOSTICS MENU
1 Read FlashID [70]
2 ROM Checksum [71]
3 Scratch Detector Test [72]

MAIN > PROCESSOR PERIPHERALS > PCM CLOCK MENU
1 PCM_CLK In CDDA Mode (11.3MHz) [8a]
2 PCM_CLK In DVD Mode (12.3MHz) [8b]
3 PCM_CLK In DVD96kHz Mode (24.6MHz) [8c]

MAIN > PROCESSOR PERIPHERALS > FLASH MENU
1 Verify FLASH Checksum [6]
2 Show FLASH Checksum [62]

MAIN > PROCESSOR PERIPHERALS > NVRAM MENU
1 I2C NVRAM Acces [11]
2 NVRAM Config [34]
3 NVRAM Reset [35]

4 NVRAM Modify [36]
5 NVRAM Read/Wr Test [15]

MAIN > MISCELLANEOUS > STATISTICS INFO MENU
1 Total Nr Of Times Tray Open [47a]
2 Total Time Power On [47b]
3 Total Play-Time CDDA & VCD [47c]
4 Total Play-Time DVD [47d]

Third Level Submenus

MAIN > AUDIO > EXT DAC BOARD > I2C TEST MENU
1. I2C Test [66a]
2. I2C Enable Pin On [66b]
3. I2C Enable Pin Off [66c]

MAIN > AUDIO > EXT DAC BOARD > CLOCK MENU
1. Clock Internal [67a]
2. Clock External [67b]
3. Clock Upsampling 192k (963 only) [82a]
4. Clock Upsampling 96k (963 only) [82b]
5. Clock Upsampling On (963 only) [82c]
6. Clock Upsampling Off (963 only) [82d]

MAIN > AUDIO > EXT DAC BOARD > AUDIO
1. Audio Pre-Mute On [68a]
2. Audio Pre-Mute Off [68b]
3. Audio Center On [69a]
4. Audio Center Off [69b]

MAIN > AUDIO > EXT DAC BOARD > LOW POWER STANDBY
1. Low Power Standby On [81a]
2. Low Power Standby Off [81b]

MAIN > AUDIO > EXT DAC BOARD > DAC MODE MENU
1. DAC CDDA Mode [80a]
2. DAC DVD48 Mode [80b]
3. DAC DVD96 Mode [80c]
4. DAC DSD Mode [80d

MAIN > BASIC ENGINE > MECHANISM > DISC MOTOR MENU
1 Disc Motor On [39a]
2 Disc Motor Off [39b]

MAIN > BASIC ENGINE > MECHANISM > LASER MENU
1 CD Laser On [58a]
2 CD Laser Off [58b]
3 DVD Laser On [58c]
4 DVD Laser Off [58d]

MAIN > BASIC ENGINE > MECHANISM > TRAY MENU
1 Tray Open [43b]
2 Tray Close [43a]

MAIN > BASIC ENGINE > MECHANISM > FOCUS MENU
1 Focus On [38a] (load DVD first)
2 Focus Off [38b]

MAIN > BASIC ENGINE > MECHANISM > RADIAL MENU
1 Radial Control On [40a] (load DVD first)
2 Radial Control Off [40b]

MAIN > BASIC ENGINE > MECHANISM > SLEDGE MENU
1 Sledge Inwards [41a]
2 Sledge Outwards [41b]

MAIN > BASIC ENGINE > MECHANISM > GROOVES (Uses DVD) MENU
1 Jump To Inside Grooves [42a]
2 Jump To Middle Grooves [42b]
3 Jump To Outside Grooves [42c]

5.8 Nuclei Error Codes

In the following tables the error description of the error codes will be described.

5.8.1 Audio Nuclei

Error code	Error text
1880	Test successful
1800	Test successful
1900	Test successful
1920	Test successful
2000	Test successful
2020	Test successful
2100	Test successful
5600	Test successful
5620	Test successful
7900	"Checksums = 0xA1, 0xB1, 0xC1, 0xD1"
7901	"DAC I2C bus busy"
7902	"DAC I2C expander "
8000	"Test successful"
8001	"DAC mode CDDA I2C bus busy before start"
8002	"DAC mode CDDA I2C connection failed"
8020	"Test successful"
8021	"DAC mode DVD48 I2C bus busy before start"
8022	"DAC mode DVD48 I2C connection failed"
8040	"Test successful"
8041	"DAC mode DVD96 I2C bus busy before start"
8042	"DAC mode DVD96 I2C connection failed"
8060	"Test successful"
8061	"DAC mode DSD I2C bus busy before start"
8062	"DAC mode DSD I2C connection failed"
8100	"Test successful"
8101	"Low Power Standby On I2C bus busy"
8102	"Low Power Standby On I2C connection failed"
8120	"Test successful"
8121	"Low Power Standby Off I2C bus busy"
8122	"Low Power Standby Off I2C connection failed"
8200	"Test successful"
8201	"DAC Upsample 192k I2C bus busy"
8202	"DAC Upsample 192k I2C connection failed"
8220	"Test successful"
8221	"DAC Upsample 96k I2C bus busy"
8222	"DAC Upsample 96k I2C connection failed"
8200	"Test successful"
8201	"DAC UpSample On bus busy"
8202	"DAC UpSample On I2C connection failed"
8200	"Test successful"
8201	"DAC UpSample Off bus busy"
8202	"DAC UpSample Off I2C connection failed"

5.8.2 Basic Engine Nuclei

Error code	Error text
3900	Test successful
3901	“Parity error from Basic Engine to Serial”
3902	“Unexpected response from Basic Engine”
3903	“Communication time-out error”
3904	“Basic Engine returned error number 0xXX”
3921	“Parity error from Basic Engine to Serial”
3922	“Unexpected response from Basic Engine”
3923	“Communication time-out error”
3924	“Basic Engine returned error number 0xXX”
3800	Test successful
3801	“Parity error from Basic Engine to Serial”
3802	“Unexpected response from Basic Engine”
3803	“Communication time-out error”
3804	“Basic Engine returned error number 0xXX”
3805	“Focus loop could not be closed”
3820	Test successful
3821	“Parity error from Basic Engine to Serial”
3822	“Unexpected response from Basic Engine”
3823	“Communication time-out error”
3824	“Basic Engine returned error number 0xXX”
4200	Test successful
4201	“Parity error from Basic Engine to Serial”
4202	“Unexpected response from Basic Engine”
4203	“Communication time-out error”
4204	“Basic Engine returned error number 0xXX”
4205	“Sledge could not be moved to home position”
4206	“Focus loop could not be closed”
4207	“Motor not on speed within time-out”
4208	“Radial loop could not be closed”
4209	“PLL could not lock in accessing or tracking state”
4210	“Subcode or sector information could not be read”
4211	“Requested subcode item could not be found”
4212	“TOC could not be read in time”
4213	“Seek could not be performed”
4220	Test successful
4221	“Parity error from Basic Engine to Serial”
4222	“Unexpected response from Basic Engine”
4223	“Communication time-out error”
4224	“Basic Engine returned error number 0xXX”
4225	“Sledge could not be moved to home position”
4226	“Focus loop could not be closed”
4227	“Motor not on speed within time-out”
4228	“Radial loop could not be closed”
4229	“PLL could not lock in accessing or tracking state”
4230	“Subcode or sector information could not be read”
4231	“Requested subcode item could not be found”
4232	“TOC could not be read in time”
4233	“Seek could not be performed”
4240	Test successful
4241	“Parity error from Basic Engine to Serial”
4242	“Unexpected response from Basic Engine”
4243	“Communication time-out error”
4244	“Basic Engine returned error number 0xXX”
4245	“Sledge could not be moved to home position”
4246	“Focus loop could not be closed”
4247	“Motor not on speed within time-out”
4248	“Radial loop could not be closed”
4249	“PLL could not lock in accessing or tracking state”
4250	“Subcode or sector information could not be read”
4251	“Requested subcode item could not be found”
4252	“TOC could not be read in time”
4253	“Seek could not be performed”
4000	Test successful
4001	“Parity error from Basic Engine to Serial”
4002	“Unexpected response from Basic Engine”
4003	“Communication time-out error”
4004	“Basic Engine returned error number 0xXX”
4005	“Radial loop could not be closed”
4020	Test successful
4021	“Parity error from Basic Engine to Serial”
4022	“Unexpected response from Basic Engine”
4023	“Communication time-out error”
4024	“Basic Engine returned error number 0xXX”
4400	Test successful
4401	Test successful
4100	Test successful
4101	“Parity error from Basic Engine to Serial”
4102	“Unexpected response from Basic Engine”
4103	“Communication time-out error”
4104	“Basic Engine returned error number XX”
4120	Test successful
4121	“Parity error from Basic Engine to Serial”
4122	“Unexpected response from Basic Engine”
4123	“Communication time-out error”
4124	“Basic Engine returned error number XX”
4300	Test successful
4301	“Parity error from Basic Engine to Serial”
4302	“Unexpected response from Basic Engine”
4303	“Communication time-out error”
4304	“Basic Engine returned error number 0xXX”
4320	Test successful
4321	“Parity error from Basic Engine to Serial”
4322	“Unexpected response from Basic Engine”
4323	“Communication time-out error”
4324	“Basic Engine returned error number 0xXX”
3700	“Version: X.Y.Z”
3701	“Parity error from Basic Engine to Serial”
3702	“Unexpected response from Basic Engine”
3703	“Communication time-out error”
3704	“Basic Engine returned error number 0xXX”
5800	Test successful

Error code	Error text
5820	Test successful
5840	Test successful
5860	Test successful
5801	"Unexpected response from Basic Engine"
7000	"Manuf. ID: <XX>" "Device ID: <YY>"
7001	"Comm Test Failed"
7002	"Load Cmd Failed"
7003	"Load Dat Failed"
7004	"Run Cmd Failed"
7100	"ROM Checksum: XXXX"
7101	"Comm Test Failed"
7102	"Load Cmd Failed"
7103	"Load Dat Failed"
7104	"Run Cmd Failed"
7201	"Comm Test Failed"
7200	"Test successful"
7202	"Load Cmd Failed"
7203	"Load Dat Failed"
7204	"Run Cmd Failed"
7205	"Scratch circuit not OK"

5.8.3 Display PWB Nuclei

Error code	Error text
3000	“Test successful”
3001	“Disp not responding”
3002	“Disp key no response”
3003	“One or more patterns not correct”
3004	“Disp type invalid”
3020	“Test successful”
3021	“Disp not responding”
3022	“Disp key no response”
3023	“One or more patterns not correct”
3040	“Test successful”
3041	“Disp not responding”
3042	“Disp key no response”
3043	“One or more patterns not correct”
2700	“Model name in wich the test is running”
2701	“Disp key no response”
2702	“Disp not responding”
2707	“Stop key not pressed”
2708	“Pause key not pressed”
2709	“Play key not pressed”
2710	“Open/close key not pressed”
2713	“Previous key not pressed”
2714	“Next key not pressed”
2715	“More than one key not pressed”
2716	" Audio key not pressed"
2900	“Test successful”
2901	“Slave not responding”
2902	“Slave keyboard not responding”
2903	“Standby led not working”
2800	“Test successful”
2801	“Slave display controller not responding”
2802	“Slave keyboard not responding”
2803	“No key press received from remote control”

Error code	Error text
2600	“The ROM version of the slave processor = 0xXX, and the internal ID = 0xYY”
2601	“I2c bus busy”
2602	“I2c bus not working“
6000	P50 test
6001	“No readback on P50”
6002	“Disp not responding “
6003	“P50 readback error”

5.8.4 Processor & Peripherals Nuclei

Error code	Error text
700	Test successful
720	Test successful
740	Test successful
600	"All checksums are correct"
601	“Following checksum is faulty: BootCode1 Checksum is 0xY2 and is not correct (must be 0xZ2)”
601	“This test is not available when stand-alone compiled”
6200	"Checksums = 0xA1, 0xB1, 0xC1, 0xD1"
6201	“This test is not available when stand-alone compiled”
1000	Test successful
1001	Test successful
1020	Test successful
1021	Test successful
1100	Test successful
1104	“NVRAM reply time-out”
1200	Test successful
1202	“Slave bus not working”
1203	“Slave controller not responding”
1204	“Slave response is not correct”
5900	Test successful
5901	“I2c bus busy”
5902	“I2c bus not working“
5904	“DTS chip response not correct”
1300	Test successful
1301	“Parity error from basic engine to serial”
1302	“Parity error from serial to basic engine”
1303	“No communication between serial and basic engine”
1304	“Communication time-out error”
1600	Test successful
1601	“The DVD SDRAM is faulty”

5.8.5 Log Nuclei

Error code	Error text
3100	"Show error log"
3101	"Error log is invalid"
3102	"Error log could not be read from NVRAM"
3103	"I2C bus busy before start"
3200	"Show error bit"
3201	"Error log is invalid"
3202	"I2C bus busy before start"
3203	"Error log could not be read from NVRAM"
3300	"Error log is cleared"
3301	"Error log could not be cleared"
3302	"I2C bus busy before start"

5.8.6 Miscellaneous Nuclei

Error code	Error text
3400	Test successful
3401	“The configuration data could not be read from NVRAM”
3402	“I2C bus busy before start”
3500	“NVRAM is cleared”
3501	“The NVRAM could not be reset.”
3502	“I2C bus busy before start”
3600	“NVRAM contents updated.”
	“NVRAM contents and configuration checksum updated.”
3601	“NVRAM contents could not be updated.”
3602	“I2C bus busy before start”
3603	“NVRAM contents could not be read”
3604	“NVRAM not accessible.”
3605	“NVRAM checksum could not be updated.”
1500	Test successful
1502	“NVRAM access time-out”
1504	“NVRAM fails”
5400	Test successful
5401	“I2c bus busy”
5402	“I2c bus not working“
5403	“Scart switch controller not responding”
5404	“Scart switch controller response not correct”
5500	Test successful
5501	“I2c bus busy”
5502	“I2c bus not working“
5520	Test successful
5521	“I2c bus busy”
5522	“I2c bus not working“
5523	“Scart switch controller not responding”
5200	Test successful
5201	“I2c bus busy”
5202	“I2c bus not working“
5300	Test successful
5301	“I2c bus busy”
5302	“I2c bus not working“
5320	Test successful
5321	“I2c bus busy”
5322	“I2c bus not working“
4700	“Number of times Tray went Open : XX”
4701	The total number of times tray went open could not be read from NVRAM.
4702	I2C bus busy before start
4720	“Total Power On time (minutes) : XX”
4721	The total power-on time could not be read from NVRAM.
4722	I2C bus busy before start
4740	“Total CDDA & VCD disks Play-time (minutes) : XX”
4741	The playtime of CDDA & VCD disks could not be read from NVRAM.
4742	I2C bus busy before start
4760	“Total DVD disks Play-time (minutes) : XX”
4761	The playtime of DVD disks could not be read from NVRAM.
4762	I2C bus busy before start
4600	“Version of Application Software : XX”
4601	“The application version could not be read from NVRAM.”
4602	“I2C bus busy before start”

5.8.7 Video Nuclei

Error code	Error text
2300	Test successful
2320	Test successful
2340	Test successful
2400	Test successful
2401	“I2c bus busy”
2421	“I2c bus busy”
2441	“I2c bus busy”
2500	Test successful
2501	“I2c bus busy”
2502	“I2c bus not working“
2520	Test successful
2521	“I2c bus busy”
2522	“I2c bus not working“
2540	Test successful
2541	“I2c bus busy”
2542	“I2c bus not working“
6100	Test successful
6100	Test successful

5.8.8 Furore Nuclei

Error code	Error text
8300	"Test successful"
8301	"Invalid Version ID read. "
8400	"Test successful"
8420	"Test successful"

5.9 Test Instruction Front Display and Audio/ Video Board

These test instruction is designed specifically for SACD 2002 single disc models which has the following outputs:

- 6 Channel Audio output
- Coaxial / Optical digital output
- CVBS
- Component output YUV
- SVHS
- Double SCART output
- Front Display

5.9.1 General

- All the waveforms measurement carried out in these test instruction will be base on the testpoint indicated in the A/V Board and Front Display schematic diagram in the Service manual.
- Impedance of the measuring-equipment should be > 1MΩ
- Most of the tests can be done using either the Diagnostic software " Player script" which can be found in the chapter "Diagnostic Software description and troubleshooting" or the Menu interface using the Service PC with a terminal emulation program (e.g. Window Hyperterminal) where it is possible to control the execution of the Diagnostic Nuclei
- Setup for the measurement will be done in set level with all modules connected as shown in the Wiring Block diagram.

5.9.2 General Start-Up Measurement

Supply Check:

Before starting the measurement,ensure that all power supply are connected to the A/V and Front Display board via conn.1420 and 1108 respectively.

Pin nr.	A/V Board	Front Display
Voltage	Conn. 1420	Conn. 1108
1	+3V3_Power	-
2	+3V3_Power	-
3	GND	-
4	+12V_Power	-
5	+12VSTBY	-
6	GND	+5VSTBY
7	+5VSTBY	+12V_Power
8	GND	-32V_Power
9	-12V_Power	-
10	GND	-
11	-32V_Power	-
12		-

Clock Check

Ensure the present of the clock to the DAC and the slave μP.

Clock Name	Testpoint	Frequency
PCM_CLK	I116	11.2896MHz ± 0.02% tolerance
XOUT	S1	8MHz ± 0.2% tolerance

Audio Mute Check

Measure the Audio mute voltage input at pin 22 of connector 1421

Status	Value
AudioMuteOn	HIGH (>3V)
AudioMuteOff	LOW (<3V)

To toggle between ON and OFF,use the following commands:

Ref.#	Command Name	Remarks
19a	AudioMuteOn	Audio Mute On
19b	AudioMuteOff	Audio Mute Off

5.9.3 Audio DAC And Amplifier

Ensure that the Audio mute signal is OFF
To check the DAC and buffer amplifier,send the following commands.

Ref.#	Command Name	Remarks	Audio output
21a	AudioSineOn	Audio Sine signal ON	Sine,1Khz on stereo
----	Press stop button	Audio Sine signal OFF	No waveform
20a	AudioPinkNoiseOn	Audio Pinknoise ON	Pink Noise on 6 channels
20b	AudioPinkNoiseOff	Audio Pinknoise OFF	No waveform

The audio signal (sine or pink noise) will also be present on the digital output (SPDIF).This can be checked by connecting digital signal to an amplifier with digital input.
Check the I2S and audio signal at the following testpoints:

Name	Testpoint
PCM_LRCLK	I112
PCM_SCLK	I114
PCM_CLK	I116
SDT1	I110
SDT2	I106
SDT3	I102
DIG_OUT	I629
STEREO L/R OUT	I510 / I520
FRONT L/R OUT	I552 / I524
SURROUND L/R OUT	I533 / I536
CENTRE OUT	I530
SUB WOOFER L/R OUT	I527

All waveforms can be refered to the A/V board schematic diagram.

5.9.4 Video Output And Buffer Amplifier

Check DC output-level at all video cinch output : 1.0V DC ± 10%
Generate a color bar using the following software commands:

Ref.#	Command Name	Remarks
23a	VideoColDencOn	Colour DENC ON
23b	VideoColDencOff	Colourbar DENC OFF

Check the video outputs at the following testpoints:

Name	Testpoint
GREEN_SCART	I601
BLUE_SCART	I600
RED_SCART	I602
CVBS out_Mono	I662
C_Mono	I675
Y_Mono	I667

ll waveforms can be refered to the A/V board schematic diagram.

5.9.5 Play and 16/9 Detection

Check DC voltage at S-VIDEO-CHROMA output (pin 4) with a 6k8 ohm load and SCART connector 1403 (pin 16) and change the SCART0 and SCART1 input using the following commands:

Ref.#	Command Name	Remarks
25a	VideoScartLo	Sends out 0V ± 0.5V
25b	VideoScartMi	Sends out 6V ± 10%

Ref.#	Command Name	Remarks
25c	VideoScartHi	Sends out 12V ± 10%

5.9.6 Kill Circuit

To check the functionality of the Kill circuitry,the audio outputs has to be present by the following command:

Ref.#	Command Name	Remarks	Audio output
21a	AudioSineOn	Audio Sinewave ON	1kHz tone

Check the audio outputs at the audio cinch of the A/V and SCART board: 1kHz tone.

Activate the Kill circuit by using the following command:

Ref.#	Command Name	Remarks
19a	AudioMuteOn	Audio Mute On

Check the audio outputs at the audio L/R cinch and SCART of the A/V and SCART board respectively: No waveform
Switch off the kill circuit by using the following command:

Ref.#	Command Name	Remarks
19b	AudioMuteOff	Audio Mute Off

Check the audio outputs at the audio L/R cinch and SCART of the A/V and SCART board: 1kHz tone

5.9.7 Digital Silence

Digital silence is a signal from the audio DAC7301 (MFL,MFR) and DAC7300 (MSR/MC),when there is no input to the audio DAC, or when the player is in STOP/PAUSE mode, or during disc changing track.

To check the MFL signal, use the following command and check the voltage level at pin 41 of 7200:

Ref.#	Command Name	Remarks	KILL_LR signal
21a	AudioSineOn	Audio Sinewave ON	LOW (<0.3V)
---	Press STOP button	Audio Sine signal OFF	HIGH (>4.5V)

5.9.8 Front Display

To check the segment display of the FTD, the following command can be used. And for full detail description of the test, refer to the chapter of “Diagnostic Software Player Script” which can be found in chapter “Diagnostic Software Description and Troubleshooting”

Ref.#	Command Name	Remarks
30a	DispDisplay	Turn ON local display

5.9.9 IR Receiver

Check at pin 22 of 7401 and observe if this line switches from LOW (<0.3V) to HIGH (>4.5V) when pressing a key on a philips RC5 or RC6 remote control

5.9.10 P50 Interface

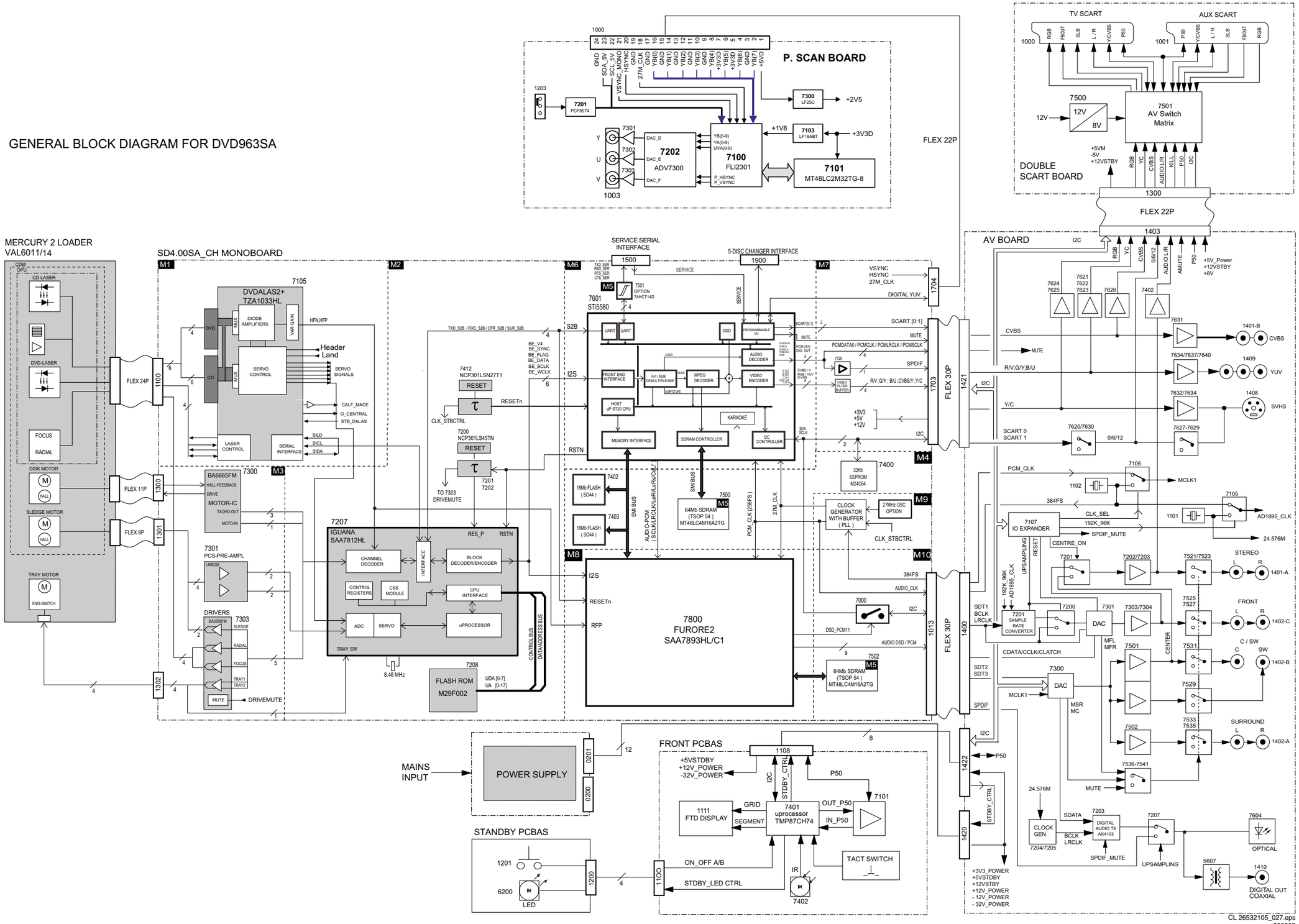
P50 (or Easylink) is a bi-directional serial interface for communication between video equipment. To check for the functionality of the P50 Interface, refer to the chapter of ‘Diagnostic Software Player Script’ for full detail description.

Personal Notes:

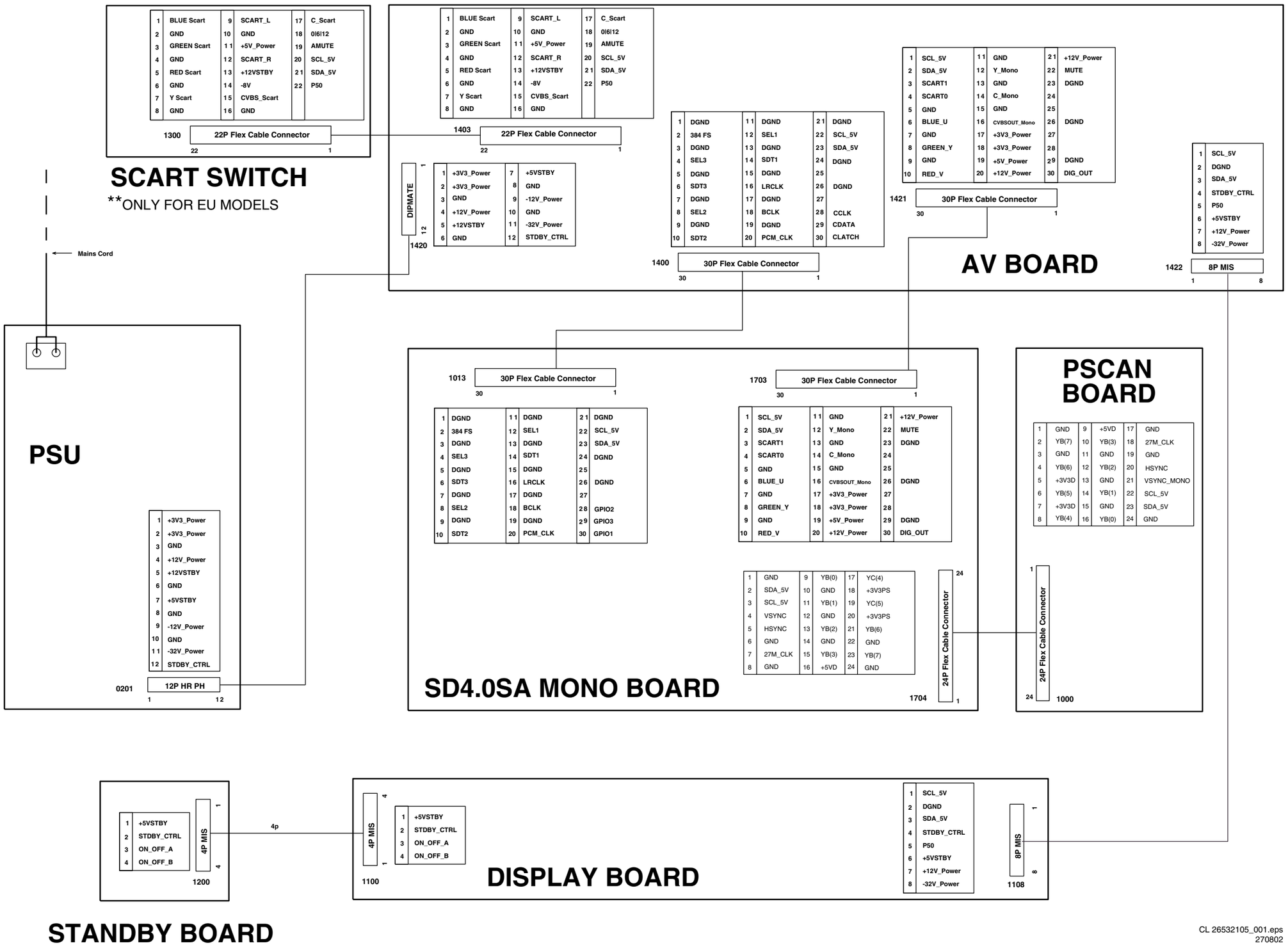
6. Block and Wiring Diagram.

Block Diagram DVD963SA

GENERAL BLOCK DIAGRAM FOR DVD963SA



Wiring Diagram DVD963SA



1	BLUE Scart	9	SCART_L	17	C_Scart
2	GND	10	GND	18	0I6I12
3	GREEN Scart	11	+5V_Power	19	AMUTE
4	GND	12	SCART_R	20	SCL_5V
5	RED Scart	13	+12VSTBY	21	SDA_5V
6	GND	14	-8V	22	P50
7	Y Scart	15	CVBS_Scart		
8	GND	16	GND		

1	+3V3_Power	7	+5VSTBY		
2	+3V3_Power	8	GND		
3	GND	9	-12V_Power		
4	+12V_Power	10	GND		
5	+12VSTBY	11	-32V_Power		
6	GND	12	STDBY_CTRL		

1	DGND	11	DGND	21	DGND
2	384 FS	12	SEL1	22	SCL_5V
3	DGND	13	DGND	23	SDA_5V
4	SEL3	14	SDT1	24	DGND
5	DGND	15	DGND	25	
6	SDT3	16	LRCLK	26	DGND
7	DGND	17	DGND	27	
8	SEL2	18	BCLK	28	CCLK
9	DGND	19	DGND	29	CDATA
10	SDT2	20	PCM_CLK	30	CLATCH

1	SCL_5V	11	GND	21	+12V_Power
2	SDA_5V	12	Y_Mono	22	MUTE
3	SCART1	13	GND	23	DGND
4	SCART0	14	C_Mono	24	
5	GND	15	GND	25	
6	BLUE_U	16	CVBSOUT_Mono	26	DGND
7	GND	17	+3V3_Power	27	
8	GREEN_Y	18	+3V3_Power	28	
9	GND	19	+5V_Power	29	DGND
10	RED_V	20	+12V_Power	30	DIG_OUT

1	SCL_5V				
2	DGND				
3	SDA_5V				
4	STDBY_CTRL				
5	P50				
6	+5VSTBY				
7	+12V_Power				
8	-32V_Power				

1	+3V3_Power				
2	+3V3_Power				
3	GND				
4	+12V_Power				
5	+12VSTBY				
6	GND				
7	+5VSTBY				
8	GND				
9	-12V_Power				
10	GND				
11	-32V_Power				
12	STDBY_CTRL				

1	GND	9	+5VD	17	GND
2	YB(7)	10	YB(3)	18	27M_CLK
3	GND	11	GND	19	GND
4	YB(6)	12	YB(2)	20	HSYNC
5	+3V3D	13	GND	21	VSYNC_MONO
6	YB(5)	14	YB(1)	22	SCL_5V
7	+3V3D	15	GND	23	SDA_5V
8	YB(4)	16	YB(0)	24	GND

1	GND	9	YB(0)	17	YC(4)
2	SDA_5V	10	GND	18	+3V3PS
3	SCL_5V	11	YB(1)	19	YC(5)
4	VSYNC	12	GND	20	+3V3PS
5	HSYNC	13	YB(2)	21	YB(6)
6	GND	14	GND	22	GND
7	27M_CLK	15	YB(3)	23	YB(7)
8	GND	16	+5VD	24	GND

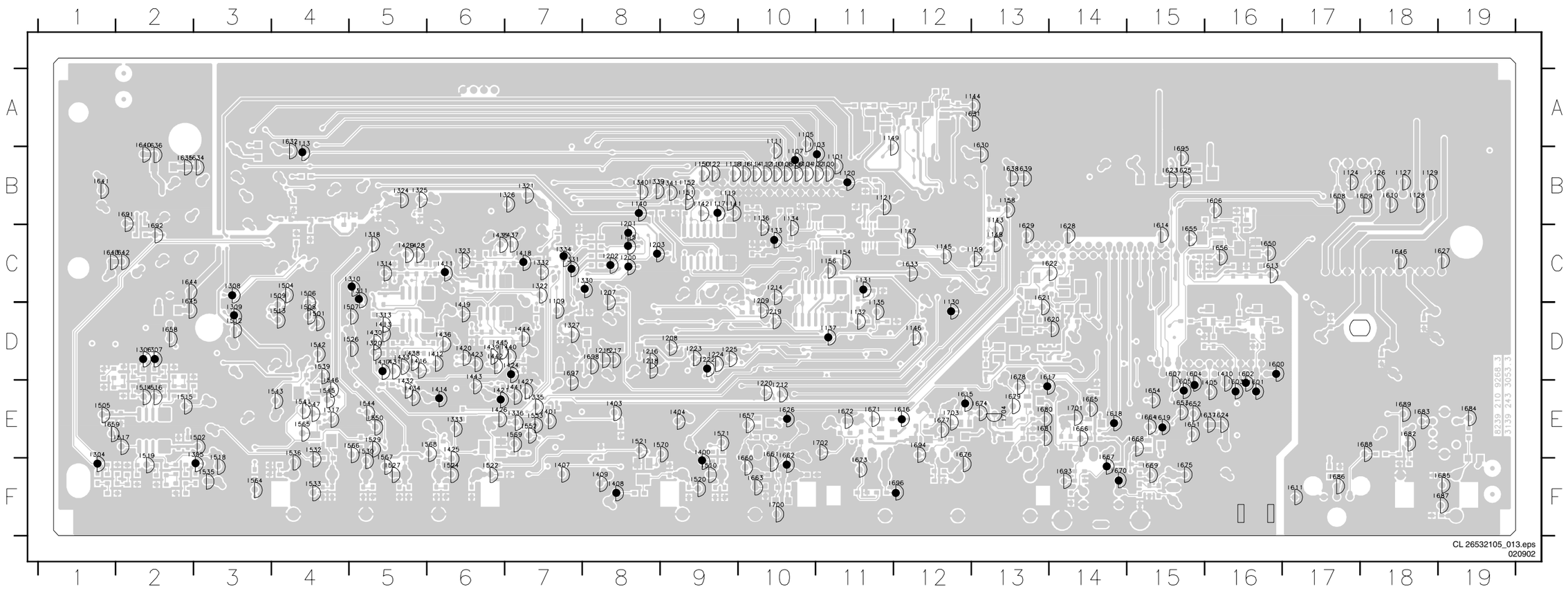
1	+5VSTBY				
2	STDBY_CTRL				
3	ON_OFF_A				
4	ON_OFF_B				

1	+5VSTBY				
2	STDBY_CTRL				
3	ON_OFF_A				
4	ON_OFF_B				

CL 26532105_001.eps
270802

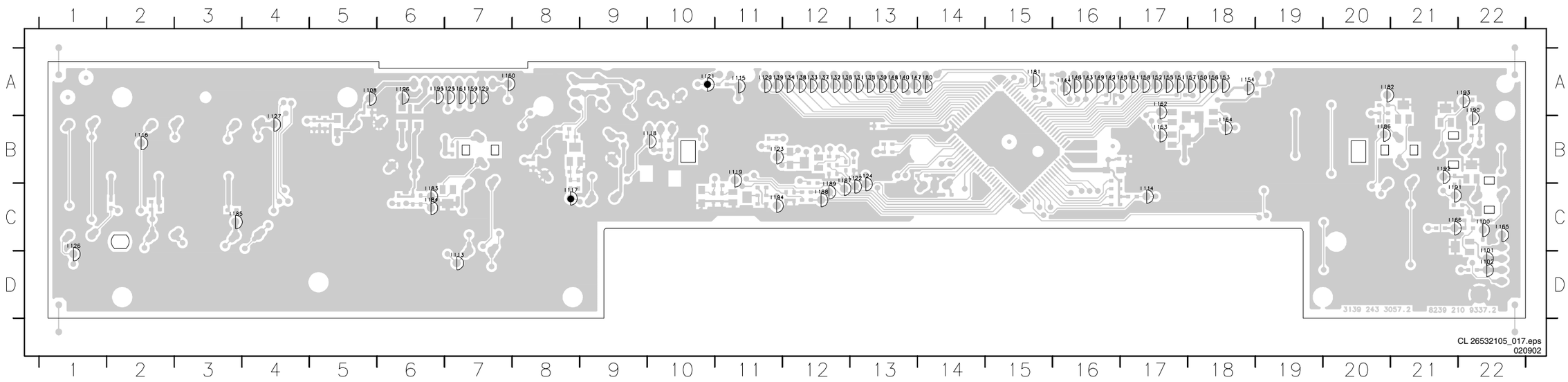
Testpoint Overview A/V Board

I100	B11	I115	C8	I132	D11	I149	B11	I212	E10	I307	D2	I326	B7	I404	E9	I421	E6	I437	C7	I508	D4	I526	D5	I547	E4	I603	E16	I619	E15	I634	B3	I652	E15	I667	F14	I682	E18	I698	D8
I101	B11	I116	B10	I133	C10	I150	B9	I214	C10	I308	C3	I327	D7	I405	E16	I423	D6	I438	D5	I509	D4	I527	F5	I550	E5	I604	E15	I620	D14	I635	B2	I653	E15	I668	E15	I683	E18	I700	F10
I102	B10	I117	B9	I134	C10	I151	B9	I215	D8	I309	D3	I330	C8	I407	F7	I424	D7	I439	D6	I510	F9	I529	E5	I552	E7	I605	E15	I621	D13	I636	B2	I654	E15	I669	F15	I684	E19	I701	E14
I103	B11	I118	B9	I135	D11	I152	B9	I216	D8	I310	C5	I331	C7	I408	F8	I425	F6	I440	D7	I512	D3	I530	F5	I553	E7	I606	B16	I622	C14	I637	E16	I655	C15	I670	F14	I685	F19	I702	E11
I104	B10	I119	B9	I136	C10	I154	C11	I217	D8	I311	C5	I332	C7	I409	F8	I426	E6	I441	E7	I513	D4	I532	F4	I564	F3	I607	E15	I623	B15	I638	B13	I656	C16	I671	E11	I686	F17	I703	E12
I105	A10	I120	B11	I137	D11	I156	C11	I218	D8	I313	D5	I333	E6	I410	E16	I427	E7	I442	D6	I514	E2	I533	F4	I565	E4	I608	B17	I624	E16	I639	B13	I657	E10	I672	E11	I687	F19	I704	E13
I106	B10	I121	B11	I140	B8	I158	B13	I219	D10	I314	C5	I334	C7	I411	C6	I428	C5	I443	E6	I515	E2	I535	F3	I566	E5	I609	B18	I625	B15	I640	B2	I658	D2	I673	F11	I688	E18		
I107	B10	I122	B9	I141	B9	I159	C13	I220	E10	I317	E4	I335	E7	I412	D6	I429	C5	I444	D7	I516	E2	I536	F4	I567	F5	I610	B18	I626	E10	I641	B1	I659	E1	I674	E13	I689	E18		
I108	B10	I124	B17	I142	B9	I200	C8	I222	D9	I318	C5	I336	E7	I413	D5	I430	D5	I445	D6	I517	E2	I539	D4	I568	E6	I611	F17	I627	C19	I642	C2	I660	F10	I675	F15	I691	B2		
I109	D7	I126	B18	I143	C13	I201	C8	I223	D9	I320	D5	I339	B8	I414	E6	I431	D5	I501	D4	I518	F3	I541	E4	I569	E7	I613	C16	I628	C14	I643	C1	I661	F10	I676	F12	I692	C2		
I110	B10	I127	B18	I144	A13	I202	C8	I224	D9	I321	B7	I340	B8	I416	D5	I432	E5	I502	E3	I519	F2	I542	D4	I570	E9	I614	C15	I629	C13	I644	C2	I662	F10	I677	E12	I693	F14		
I111	B10	I128	B18	I145	C12	I203	C8	I225	D9	I322	C7	I341	B9	I417	D5	I433	D5	I504	C4	I520	F9	I543	E4	I571	E9	I615	E12	I630	B13	I645	D2	I663	F10	I678	E13	I694	E12		
I112	B10	I129	B18	I146	D12	I207	C8	I304	F1	I323	C6	I400	F9	I418	C7	I434	E5	I505	E1	I521	E8	I544	E5	I600	D16	I616	E12	I631	A13	I646	C18	I664	E15	I679	E13	I695	B15		
I113	B4	I130	D12	I147	C12	I208	D9	I305	F3	I324	B5	I401	E7	I419	D6	I435	C6	I506	D4	I522	F6	I545	E4	I601	E16	I617	E13	I632	B4	I650	C16	I665	E14	I680	E13	I696	F12		
I114	B10	I131	C11	I148	C13	I209	D10	I306	D2	I325	B5	I403	E8	I420	D6	I436	D6	I507	D5	I524	F6	I546	E4	I602	E16	I618	E14	I633	C12	I651	E15	I666	E14	I681	E13	I697	E7		



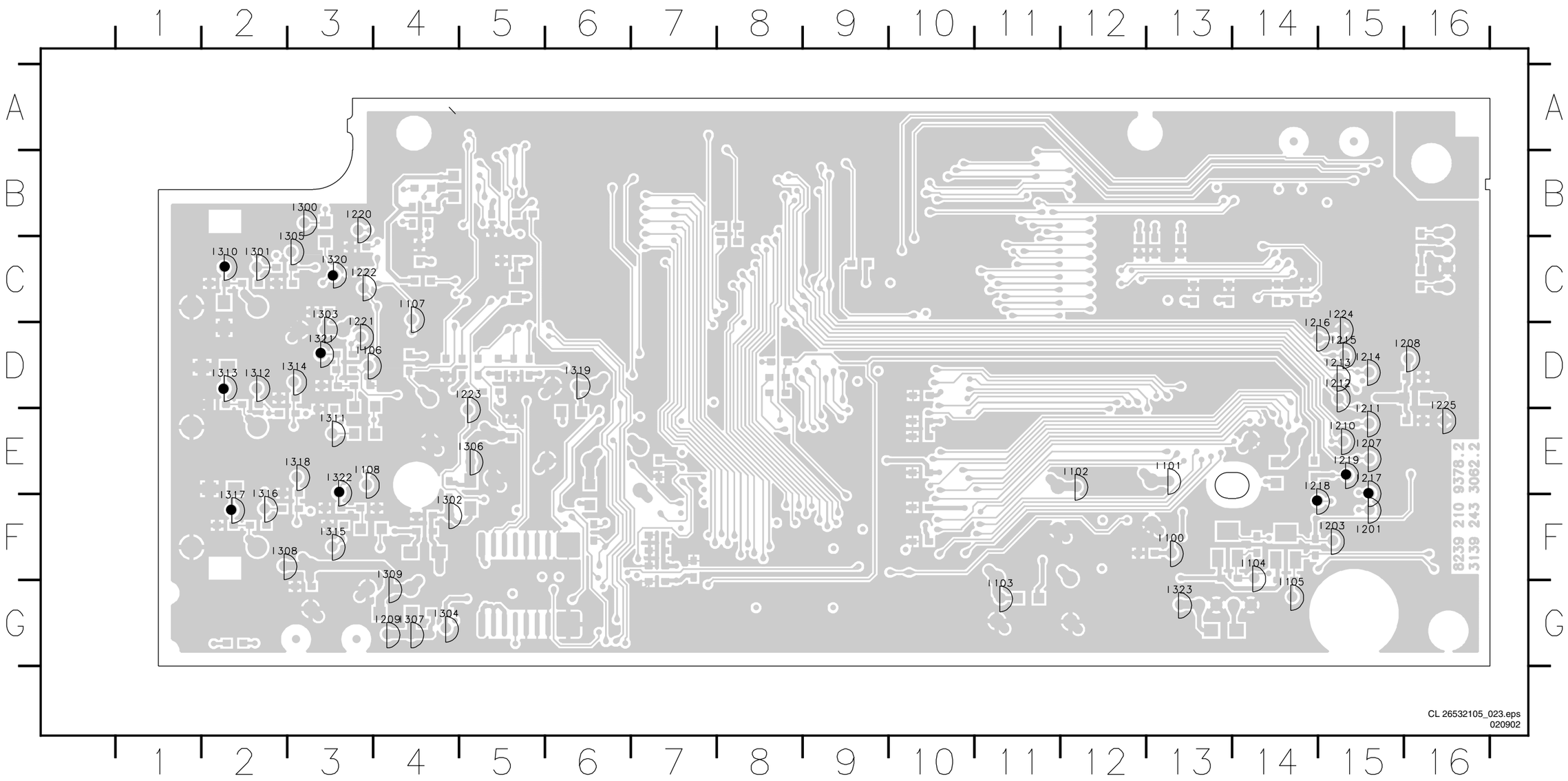
Testpoint Overview Display Panel

I100	C22	I113	D7	I117	C8	I121	A10	I125	A7	I130	A13	I134	A12	I138	A12	I142	A16	I146	A16	I150	A18	I154	A18	I158	A17	I162	A17	I166	C21	I183	C6	I187	C12	I191	C21	I195	A6
I101	D22	I114	C17	I118	B10	I122	C13	I126	D1	I131	A13	I135	A13	I139	A11	I143	A16	I147	A13	I151	A17	I155	A17	I159	A7	I163	B17	I180	A14	I184	C6	I188	C12	I192	B21	I196	A6
I102	D22	I115	A11	I119	B11	I123	B11	I127	B4	I132	A12	I136	A12	I140	A13	I144	A16	I148	A13	I152	A17	I156	A18	I160	A7	I164	B18	I181	A15	I185	C3	I189	C12	I193	A22		
I108	A5	I116	B2	I120	A11	I124	C13	I129	A7	I133	A12	I137	A12	I141	A17	I145	A16	I149	A16	I153	A18	I157	A18	I161	A7	I165	C22	I182	A20	I186	B20	I190	B22	I194	C11		



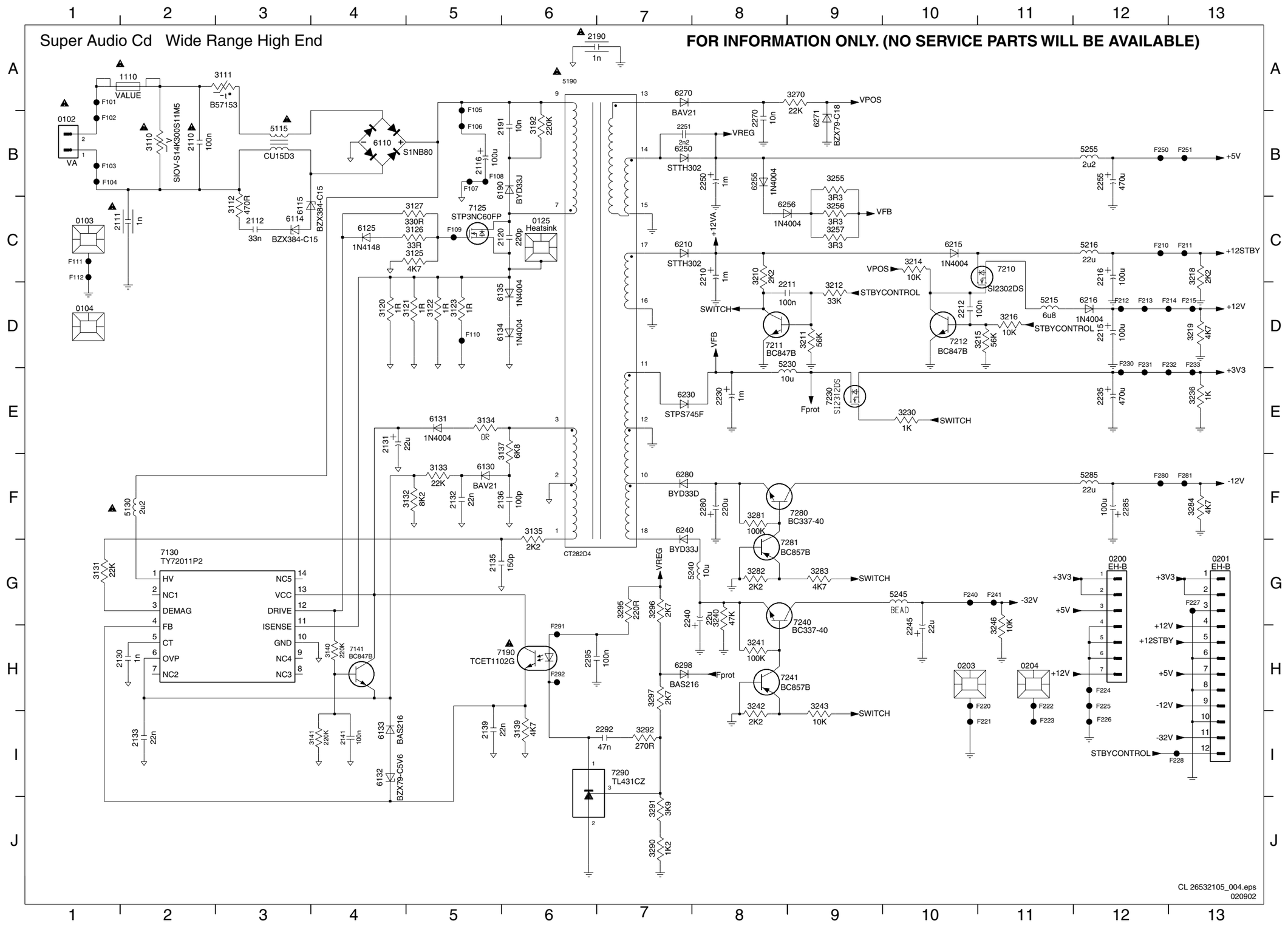
Testpoint OverviewP-Scan Board

I100	G13	I104	G14	I108	F3	I208	E16	I212	E15	I216	E14	I220	C3	I224	E15	I302	G4	I306	F5	I310	D2	I314	E3	I318	F3	I322	F3
I101	F13	I105	H14	I201	G15	I209	H4	I213	E15	I217	F15	I221	E3	I225	F16	I303	E3	I307	H4	I311	F3	I315	G3	I319	E6	I323	H13
I102	F12	I106	E3	I203	G15	I210	F15	I214	E15	I218	G14	I222	D3	I300	C3	I304	H4	I308	G2	I312	E2	I316	G2	I320	D3		
I103	H11	I107	D4	I207	F15	I211	F15	I215	E15	I219	F15	I223	F5	I301	D2	I305	D3	I309	H4	I313	E2	I317	G2	I321	E3		



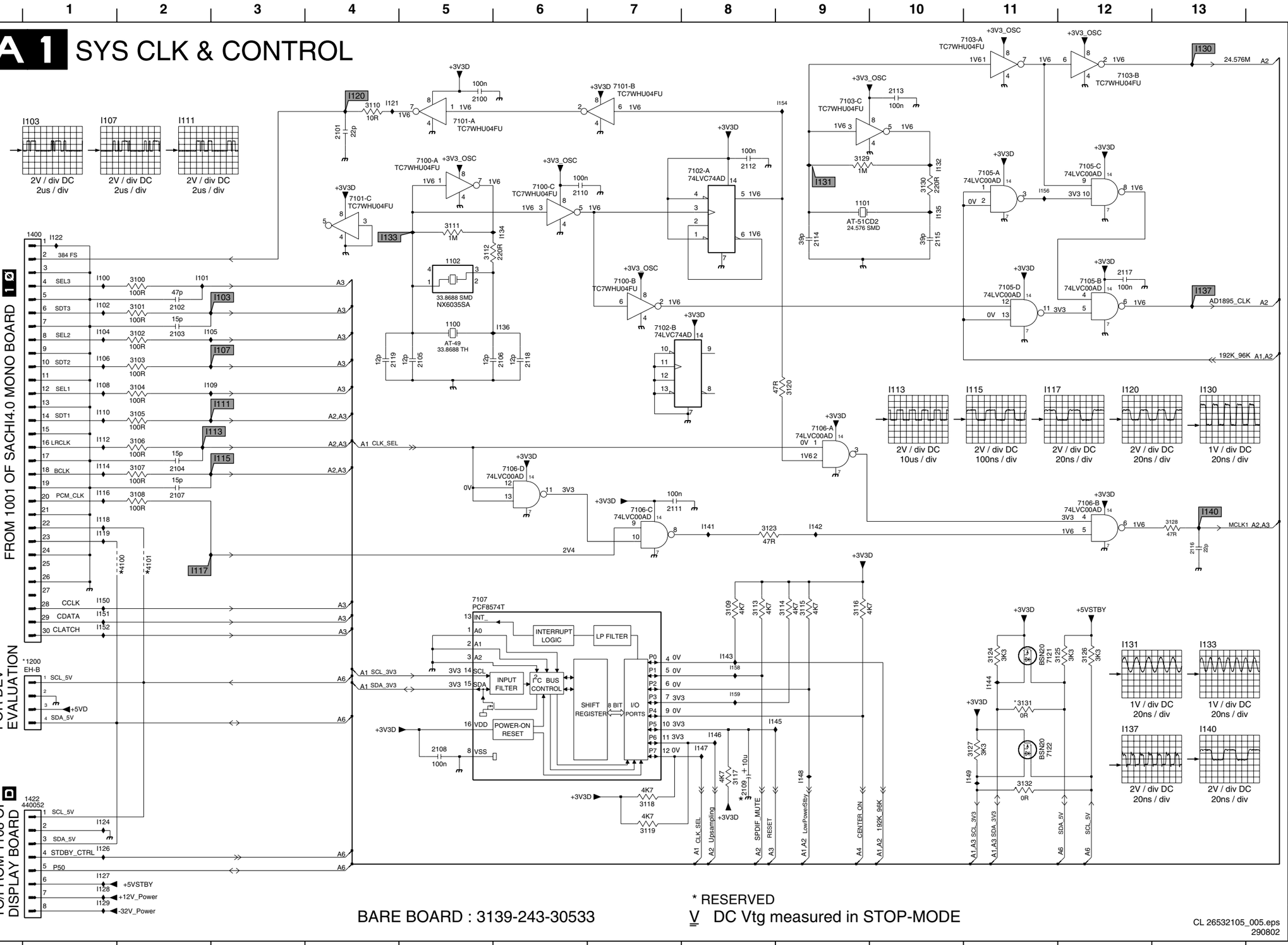
7. Electrical Diagrams

Power Supply Unit DVD963SA



AV-Board: Clock & Control

A 1 SYS CLK & CONTROL



BARE BOARD : 3139-243-30533

* RESERVED

V DC Vtg measured in STOP-MODE

CL 26532105_005.eps 290802

1100 C5 I137 C13
1101 B9 I140 E13
1102 C5 I141 E8
1200 G1 I142 E9
1400 B1 I143 G8
1422 H1 I144 G11
2100 A5 I145 H8
2101 A4 I146 H8
2102 C2 I147 H8
2103 C2 I148 H9
2104 E2 I149 H11
2105 D5 I150 F1
2106 D6 I151 F1
2107 E2 I152 G1
2108 H5 I154 A9
2109 H8 I156 B11
2110 B6 I158 G8
2111 E7 I159 G8
2112 B8
2113 A10
2114 B9
2115 B10
2116 F13
2117 C12
2118 D6
2119 D4
3100 C2
3101 C2
3102 C2
3103 D2
3104 D2
3105 D2
3106 E2
3107 E2
3108 E2
3109 F8
3110 A4
3111 B5
3112 C5
3113 F8
3114 F9
3115 F9
3116 F9
3117 H8
3118 H7
3119 I7
3120 D9
3123 F8
3124 G11
3125 G12
3126 G12
3127 H11
3128 E13
3129 B9
3130 B10
3131 G11
3132 H11
4100 F2
4101 F2
7100-A B5
7100-B C7
7100-C B6
7101-A A5
7101-B A7
7101-C B4
7102-A B8
7102-B C7
7103-A A10
7103-B A12
7103-C A9
7105-A B11
7105-B C12
7105-C B12
7105-D C11
7106-A D9
7106-B E12
7106-C E7
7106-D E6
7107 F5
7121 G11
7122 H11
I100 C1
I101 C2
I102 C1
I103 C2
I104 C1
I105 C2
I106 D1
I107 D2
I108 D1
I109 D2
I110 D1
I111 D2
I112 E1
I113 E2
I114 E1
I115 E2
I116 E1
I117 F2
I118 E1
I119 F1
I120 A4
I121 A4
I122 B1
I124 I1
I126 I1
I127 I1
I128 I1
I129 I1
I130 A13
I131 B9
I132 B10
I133 B5
I134 B6
I135 B10
I136 C6

AV-Board: Upsampling

A2 UPSAMPLING

I200 2V / div DC 2us / div
I201 2V / div DC 100ns / div
I202 2V / div DC 10us / div
I203 2V / div DC 20ns / div

7200 74LVC157A
7201 AD1895
7202 74LVC245
7203 AK4103VF
7204 74LVC161
7205 74LVC161
7206-A 74LVC04
7206-B 74LVC04
7206-C 74LVC04
7206-D 74LVC04
7206-E 74LVC04
7206-F 74LVC04
7207-A 74AC00M
7207-B 74AC00M
7207-C 74AC00M
7207-D 74AC00M
7220 BC847B
7221 BC847B
7222 BC847B

I222 500mV / div DC 200ns / div
192k 2V / div DC 2us / div
12.288M 2V / div DC 50ns / div

* RESERVED

V DC Vtg measured in STOP-MODE

BARE BOARD : 3139-243-30533

CL 26532105_006.eps 020902

2200 B6
2201 B13
2202 C4
2203 C11
2204 C8
2205 F4
2206 F5
2207 F4
2208 F5
2209 F8
2210 G3
2211 I12
2212 I10
2213 B4
3200 E5
3201 E4
3202 E5
3203 H2
3204 F3
3205 H13
3206 H9
3207 H13
3208 H12
3210 I9
3211 I9
3212 F7
3213 H3
3214 I12
3215 I2
7200 B4
7201 F4
7202 F7
7203 G10
7204 C7
7205 C10
7206-A B6
7206-B A7
7206-C A8
7206-D E11
7206-E A10
7206-F F13
7207-A C12
7207-B E12
7207-C C13
7207-D B12
7220 H2
7221 E7
7222 I3
I200 C4
I201 C4
I202 D4
I203 D4
I207 G3
I208 H3
I209 H2
I212 D12
I214 E6
I215 E4
I216 E5
I217 F4
I218 F5
I219 F7
I220 D13
I222 E13
I223 H12
I224 H12
I225 I12

AV-Board: Audio DAC

A3 AUDIO DAC

I304 1V / div DC 500us / div
I305 1V / div DC 500us / div
I306 1V / div DC 500us / div
I307 1V / div DC 500us / div
I308 1V / div DC 500us / div
I309 1V / div DC 500us / div
I310 1V / div DC 500us / div
I311 1V / div DC 500us / div
I330 2V / div DC 10us / div
I331 2V / div DC 100ns / div
I334 2V / div DC 100ns / div

For DEV Evaluation

*1201 PH-B

7300 CS4362
7301 AD1955

* RESERVED

V DC Vtg measured in STOP-MODE

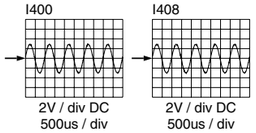
BARE BOARD : 3139-243-30533

CL 26532105_007.eps
290802

AV-Board: Current to Voltage Converter

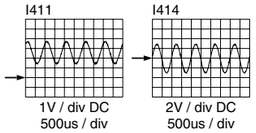
A 4 Current to Voltage Converter

ITEM NO	DESCRIPTION	DVD963SA EU	DVD963SA NON-EU
7402	IC SM LM833D (MOTA) R	X	

I400

2V / div DC
500us / div

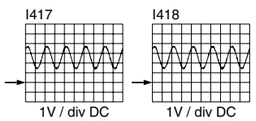
I408

2V / div DC
500us / div

I411

1V / div DC
500us / div

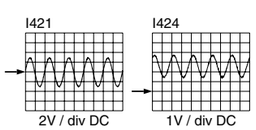
I414

2V / div DC
500us / div

I417

1V / div DC
500us / div

I418

1V / div DC
500us / div

I421

2V / div DC
500us / div

I424

1V / div DC
500us / div

* RESERVED

V DC Vtg measured in STOP-MODE

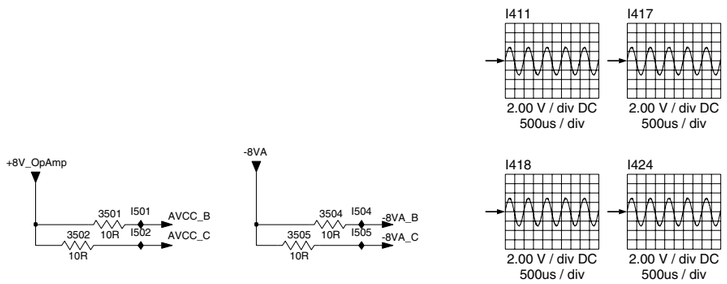
BARE BOARD : 3139-243-30533

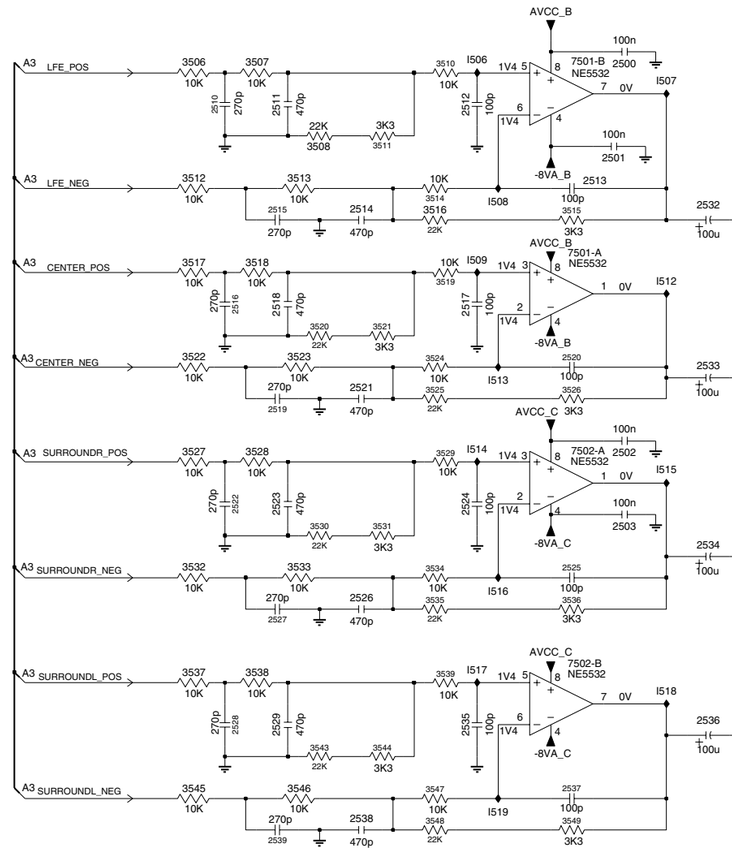
CL 26532105_008.eps
020902

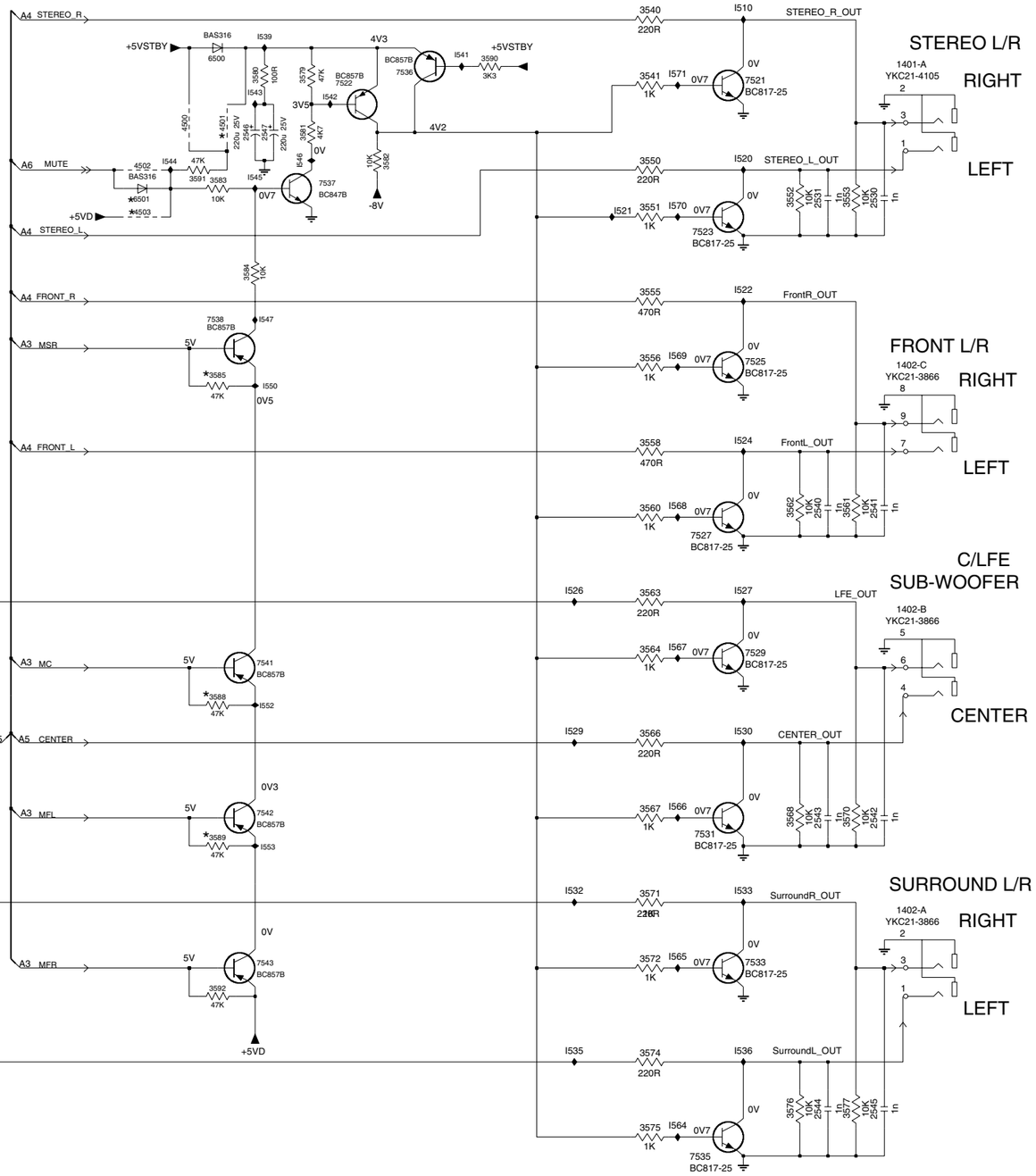
2400 A2
2401 C2
2402 B9
2403 B9
2404 B11
2405 B11
2406 E6
2407 F6
2408 H8
2409 I8
2410 G11
2411 H11
2412 B9
2413 C9
2414 E4
2415 D6
2416 G6
2417 E9
2418 E10
2419 F9
2420 F11
2421 E12
2422 H4
2423 G8
2424 I8
2425 H9
2426 H10
2427 I9
2428 H11
2429 G12
2430 D4
2431 E9
2432 G9
2433 G4
2434 G9
2435 F7
2436 H9
2437 I9
2438 I6
2439 I9
2440 E10
2441 H10
2442 H8
2443 I8
2444 F6
2445 F6
3400 A5
3401 A5
3403 D5
3404 D5
3405 D6
3406 F4
3408 G5
3409 G5
3410 G6
3411 E9
3412 E10
3413 E9
3414 E9
3415 F9
3416 F10
3417 F10
3418 F11
3419 F11
3421 F7
3422 F8
3423 G7
3424 H5
3426 I7
3427 I7
3428 I8
3429 G9
3430 G10
3431 G9
3432 H9
3433 H9
3434 H10
3435 I10
3436 H11
3437 I11
3438 D5
3439 F5
3440 F7
3441 I6
7400-A A7
7400-B B2
7400-C B7
7401-A B8
7401-B C8
7402-A D10
7402-B B10
7403-A D5
7403-B E5
7404-A G7
7404-B H7
7405-A E11
7405-B G11
7420 A5
I400 A10
I401 A7
I403 B8
I404 B8
I405 B11
I407 C8
I408 C9
I409 D8
I410 D11
I411 E6
I412 E10
I413 E5
I414 E12
I416 F11
I417 F6
I418 G8
I419 G7
I420 G10
I421 G12
I423 H11
I424 H8
I425 E12
I426 G12
I427 A5
I428 D6
I429 D6
I430 E9
I431 E9
I432 F10
I433 F11
I434 F11
I435 F8
I436 G6
I437 G8
I438 G6
I439 G9
I440 H9
I441 H10
I442 H11
I443 I11
I444 I7
I445 I7

AV-Board: Audio

A5 AV AUDIO







* RESERVED

V DC Vtg measured in STOP-MODE

BARE BOARD : 3139-243-30533

26532105_009.eps
290802

1401-A A13	3581 A8	2501 D4	3588 F7
1402-A G13	3582 A9	2502 F5	3589 G7
1402-B E13	3583 B7	2503 G5	3590 A10
1402-C C13	3584 B8	2510 D2	3591 B7
2500 D5	3585 C7	2511 D2	3592 H7
		2512 D4	4500 A7
		2513 E4	4501 A8
		2514 E3	4502 B7
		2515 E2	4503 B7
		2516 E2	6500 A7
		2517 E4	6501 B7
		2518 E2	7501-A E4
		2519 F2	7501-B D4
		2520 F4	7502-A F4
		2521 F3	7502-B H4
		2522 G2	7521 A12
		2523 G2	7522 A8
		2524 G4	7523 B11
		2525 G4	7525 C12
		2526 G3	7527 D11
		2527 H2	7529 E12
		2528 H2	7531 G11
		2529 H2	7533 H12
		2530 B13	7535 I11
		2531 B12	7536 A9
		2532 E5	7537 B8
		2533 F5	7538 C7
		2534 G5	7541 E8
		2535 H4	7542 F8
		2536 H5	7543 H8
		2537 I4	I501 B1
		2538 I3	I502 B1
		2539 I2	I504 B3
		2540 D12	I505 B3
		2541 D13	I506 D4
		2542 F13	I507 D5
		2543 F12	I508 E4
		2544 I12	I509 E4
		2545 I13	I510 A11
		2546 A8	I512 E5
		2547 A8	I513 F4
		3501 B1	I514 F4
		3502 B1	I515 G5
		3504 B3	I516 G4
		3505 B2	I517 H4
		3506 D2	I518 H5
		3507 D2	I519 I4
		3508 D2	I520 A11
		3510 D3	I521 B11
		3511 D3	I522 B11
		3512 E2	I524 D11
		3513 E2	I526 E10
		3514 E3	I527 E11
		3515 E4	I529 F10
		3516 E3	I530 F11
		3517 E2	I532 G10
		3518 E2	I533 G11
		3519 E3	I535 H10
		3520 F2	I536 H11
		3521 F3	I539 A8
		3522 F2	I541 A9
		3523 F2	I542 A8
		3524 F3	I543 A8
		3525 F3	I544 A7
		3526 F4	I545 B8
		3527 F2	I546 A8
		3528 F2	I547 C8
		3529 F3	I550 C8
		3530 G2	I552 F8
		3531 G3	I553 G8
		3532 G2	I564 I11
		3533 G2	I565 H11
		3534 G3	I566 F11
		3535 G3	I567 E11
		3536 G4	I568 D11
		3537 H2	I569 C11
		3538 H2	I570 B11
		3539 H3	I571 A11
		3540 A11	
		3541 A11	
		3543 H2	
		3544 H3	
		3545 I2	
		3546 I2	
		3547 I3	
		3548 I3	
		3549 I4	
		3550 B11	
		3551 B11	
		3552 B12	
		3553 B12	
		3555 C11	
		3556 C11	
		3558 D11	
		3560 D11	
		3561 D12	
		3562 D12	
		3563 E11	
		3564 E11	
		3566 F11	
		3567 F11	
		3568 F12	
		3570 F12	
		3571 G11	
		3572 H11	
		3574 H11	
		3575 I11	
		3576 I12	
		3577 I12	
		3579 A8	
		3580 A8	

AV-Board: Video and SCART

A6 AV VIDEO AND SCART

FROM 1703 OF SD5.0 MONO BOARD M7

TO 1300 OF SCART BOARD 5.1

FROM 0201 OF PSU

For SCART

FOR SCART

VIDEO CVBS

S-VIDEO

OPTICAL

DIGITAL

OPTION

BARE BOARD : 3139-243-30533

V DC Vtg measured in STOP-MODE

* RESERVED

CL 26532105_010.eps 020902

1401-B C13	3645 D10	7643 I3	I702 F11
1403 A1	3646 D11	I600 A1	I703 G10
1408 D13	3647 E9	I601 A1	I704 H10
1409-A E13	3648 E11	I602 A1	
1409-B F13	3649 E9	I603 A1	
1409-C G13	3650 F9	I604 B1	
1410 I13	3651 F11	I605 C1	
1420 D1	3652 H3	I606 C1	
1421 E1	3653 H4	I607 C1	
1424 E2	3654 F9	I608 C1	
2600 B10	3655 I3	I609 C1	
2601 C12	3656 G9	I610 C1	
2602 C13	3657 G11	I611 D1	
2603 E10	3659 D4	I613 F1	
2604 E13	3660 G9	I614 F1	
2605 E13	3661 F6	I615 F1	
2606 E7	3662 H9	I616 F1	
2608 F4	3663 H11	I617 G1	
2609 F5	3664 G6	I618 G1	
2610 F7	3665 H12	I619 G1	
2611 G12	3666 I5	I620 H4	
2612 D5	3667 G6	I621 H3	
2613 D6	3669 I10	I622 I3	
2614 F6	3670 I10	I623 F5	
2615 H12	3671 G3	I624 F6	
2616 G6	3672 E9	I625 F5	
2617 H9	3673 B3	I626 H1	
2618 I11	3674 A10	I627 H1	
2619 I7	3675 A10	I628 H1	
2620 I5	3676 A10	I629 I1	
2621 I12	3677 H5	I630 E5	
2622 I13	3678 H5	I631 E7	
2623 I11	3679 H6	I632 E7	
2624 I13	3680 H5	I633 F7	
2625 G6	3681 I4	I634 D4	
2626 D7	3682 I5	I635 D4	
2627 D6	3683 H3	I636 D5	
2628 E7	3684 I2	I637 F7	
2630 E12	4102 C11	I638 G6	
2631 E12	4600 C10	I639 G7	
2632 F12	4601 F12	I640 D5	
2633 D2	4602 G12	I641 D6	
2634 D2	4604 I7	I642 I6	
2635 D2	4606 D6	I643 I6	
2636 D2	4607 D7	I644 I5	
2637 D3	4608 D12	I645 I5	
2638 D3	4609 E12	I646 D1	
2641 C11	4610 F12	I650 A9	
2642 D11	4611 D11	I651 A12	
2643 F10	4612 F10	I652 A12	
2644 G10	4613 F10	I653 A11	
2645 H10	4614G10	I654 B11	
2646 H6	5600 C10	I655 B9	
3600 A8	5601 E7	I656 B9	
3601 A10	5602 E7	I657 C10	
3602 A12	5603 F7	I658 I7	
3603 A12	5604 G12	I659 I7	
3604 B3	5605 H12	I660 C10	
3605 B4	5606 H9	I661 C11	
3606 B5	5607 I11	I662 C12	
3607 B6	5608 D12	I663 C13	
3608 B6	5609 E12	I664 D9	
3609 B7	5610 F12	I665 D10	
3610 A9	6600 G11	I666 D10	
3611 A9	6601 H11	I667 D12	
3612 A11	6602 C12	I668 E10	
3614 B4	6603 D11	I669 E11	
3615 B4	6604 E11	I670 D13	
3616 B5	6605 F11	I671 E9	
3617 B6	6606 H6	I672 F10	
3618 B7	6607 I13	I673 F11	
3619 B9	7600 E5	I674 F9	
3620 A10	7601 D5	I675 E12	
3621 B11	7602 I6	I676 F12	
3622 C2	7603 D6	I677 G11	
3623 C3	7604 I9	I678 G9	
3624 C3	7620 A9	I679 H11	
3625 C4	7621 B2	I680 G12	
3626 C4	7622 B3	I681 G12	
3627 C5	7623 B4	I682 H10	
3628 C5	7624 B5	I683 H11	
3629 C6	7625 B6	I684 H12	
3630 C6	7626 B7	I685 H13	
3631 C7	7627 A12	I686 H9	
3632 C7	7628 A12	I687 I12	
3633 C8	7629 B11	I688 I9	
3634 B8	7630 B9	I689 I9	
3635 B10	7631 C10	I691 D7	
3636 B9	7632 D9	I692 D7	
3637 B12	7633 D10	I693 D12	
3638 B9	7634 F10	I694 G12	
3639 C9	7636 H4	I695 G3	
3640 C10	7637 F10	I696 F12	
3641 C12	7638 I3	I697 G6	
3642 C12	7640 G10	I698 G7	
3643 D9	7641 F4	I700 C12	
3644 D10	7642 I5	I701 D11	

ITEM NO	DESCRIPTION	DVD963SA EU	DVD963SA NONEU
1403	CON BM V 22P F 1.00 FFC 0.3 B	X	
3604	RST SM 0603 100R PM5 COL	X	
3605	RST SM 0603 100R PM5 COL	X	
3606	RST SM 0603 100R PM5 COL	X	
3607	RST SM 0603 100R PM5 COL	X	
3608	RST SM 0603 100R PM5 COL	X	
3609	RST SM 0603 100R PM5 COL	X	
3614	RST SM 0603 RC21 56R PM5 R	X	
3615	RST SM 0603 RC21 56R PM5 R	X	
3616	RST SM 0603 68R PM5 COL	X	
3617	RST SM 0603 68R PM5 COL	X	
3618	RST SM 0603 RC21 56R PM5 R	X	
3622	RST SM 0603 2K2 PM5 COL	X	
3623	RST SM 0603 75R PM5 COL	X	
3624	RST SM 0603 2K2 PM5 COL	X	
3625	RST SM 0603 75R PM5 COL	X	
3626	RST SM 0603 2K2 PM5 COL	X	
3627	RST SM 0603 75R PM5 COL	X	
3628	RST SM 0603 2K2 PM5 COL	X	
3629	RST SM 0603 75R PM5 COL	X	
3630	RST SM 0603 2K2 PM5 COL	X	
3631	RST SM 0603 75R PM5 COL	X	
3632	RST SM 0603 2K2 PM5 COL	X	
3633	RST SM 0603 75R PM5 COL	X	
3673	RST SM 0603 RC21 56R PM5 R	X	
7621	TRA SIG SM BC817-25 (COL) R	X	
7622	TRA SIG SM BC817-25 (COL) R	X	
7623	TRA SIG SM BC817-25 (COL) R	X	
7624	TRA SIG SM BC817-25 (COL) R	X	
7625	TRA SIG SM BC817-25 (COL) R	X	
7626	TRA SIG SM BC817-25 (COL) R	X	

I600-RGB Video output 500mV / div AC 20us / div

I601 RGB Video output 500mV / div AC 20us / div

I602 RGB Video output 500mV / div AC 20us / div

I603 500mV / div AC 20us / div

I604 500mV / div AC 20us / div

I605 500mV / div AC 20us

I615-YUV Video output 500mV / div AC 20us / div

I615 RGB Video output 500mV / div AC 20us / div

I616 YUV Video output 500mV / div AC 20us / div

I616 RGB Video output 500mV / div AC 20us / div

I617-YUV Video output 500mV / div AC 20us / div

I617 RGB Video output 500mV / div AC 20us / div

I618 500mV / div AC 20us / div

I619 500mV / div AC 20us

I626 500mV / div AC 20us / div

I662 500mV / div AC 20us / div

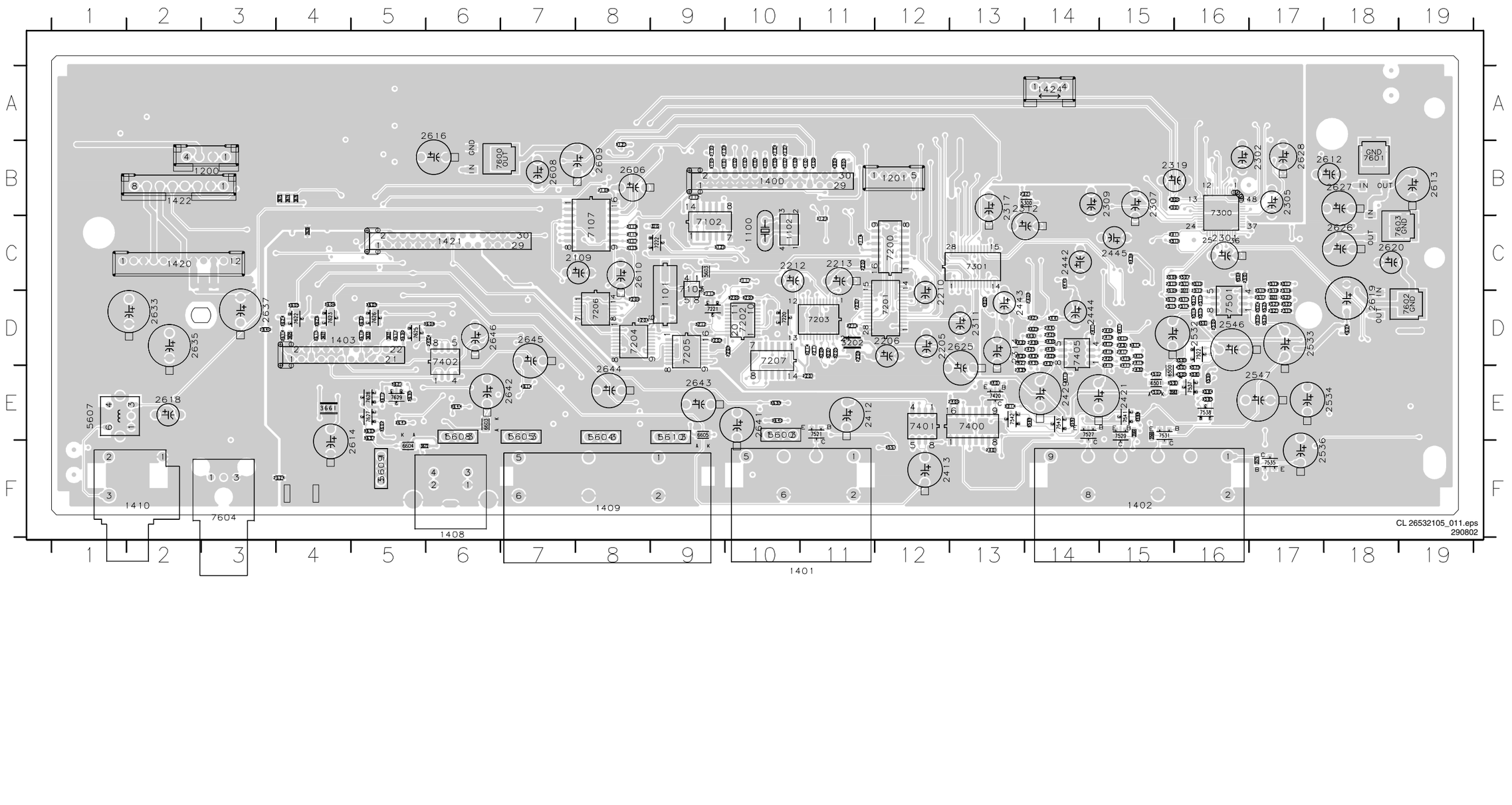
I667 500mV / div AC 20us / div

I696 500mV / div AC 20us / div

I670 500mV / div AC 20us

Layout AV-Board (Top Side)

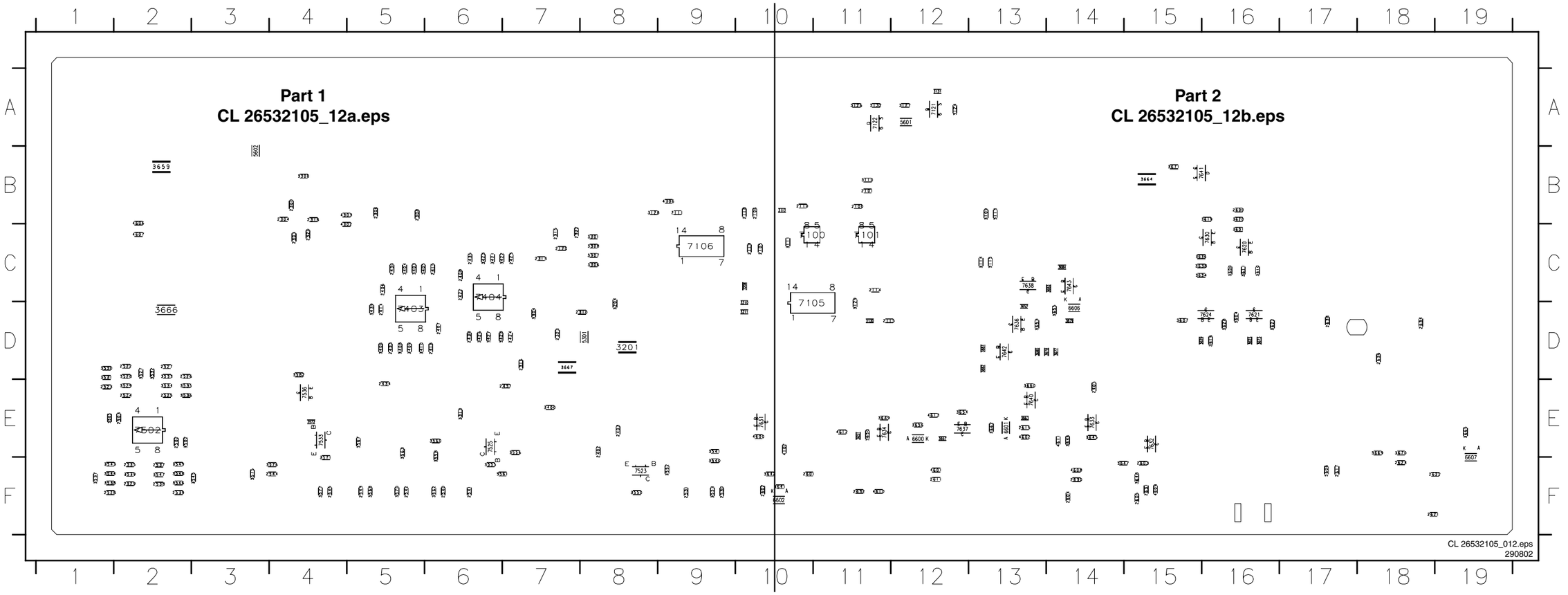
1100	C10	2103	B9	2207	D11	2319	B16	2426	D14	2510	C15	2546	D16	2627	B18	3103	B10	3205	D11	3415	D15	3440	C14	3519	D17	3584	E16	3617	D5	3644	E6	4604	D18	7102	C9	7400	E13	7543	E14
1101	D9	2104	B10	2208	D11	2321	B14	2427	D13	2511	C16	2547	E17	2628	B17	3104	B10	3207	D11	3416	D15	3441	D14	3520	D17	3585	E16	3618	D5	3661	E4	4614	E7	7103	C9	7401	E12	7600	B6
1102	C10	2107	B10	2209	D10	2400	E13	2428	D14	2512	D16	2606	B8	2633	D2	3105	B10	3208	D11	3417	E15	3501	D16	3521	D17	3588	E15	3621	E5	3672	F5	5300	B14	7107	C8	7402	D6	7601	B18
1200	B3	2108	B8	2210	D12	2401	F13	2429	E14	2513	D16	2608	B7	2635	D2	3106	B10	3212	D9	3418	D15	3504	C16	3522	D17	3589	E14	3624	D4	3674	B4	5600	E10	7200	C12	7405	D14	7602	D19
1201	B12	2109	C8	2211	D11	2404	D6	2431	D15	2514	D16	2609	B8	2637	D3	3107	B10	3213	D11	3419	E15	3506	C15	3523	D17	3590	E16	3625	D4	3675	B4	5603	C9	7201	D12	7420	E13	7603	C18
1400	B10	2112	B9	2212	C10	2409	D14	2432	E15	2515	D15	2610	C8	2639	C4	3108	B10	3214	D11	3424	D14	3507	C16	3524	D17	3591	E15	3626	D4	3676	B4	5604	E8	7202	D10	7501	D16	7604	F3
1402	F15	2113	D9	2213	C11	2410	E14	2436	D14	2516	D17	2612	B18	2640	D3	3116	C8	3215	C9	3429	D14	3508	D15	3525	D17	3592	E14	3627	D4	4100	B11	5605	E7	7203	D11	7521	E11	7622	D4
1403	D4	2116	C11	2301	C16	2411	D14	2439	E13	2517	D17	2613	B19	2641	E10	3117	C8	3305	D13	3430	D14	3510	C16	3526	D17	3602	E5	3630	D5	4101	B11	5607	E1	7204	D8	7522	D16	7623	D4
1408	F6	2117	C10	2302	B17	2412	E11	2440	D15	2518	D17	2614	F5	2642	E7	3118	C8	3310	C16	3431	D14	3511	D16	3551	F12	3603	E5	3631	D5	4300	B16	5608	E6	7205	D9	7527	E14	7625	D5
1409	F8	2200	D8	2305	B17	2413	F12	2441	D14	2519	D17	2616	A6	2643	E9	3119	C8	3311	C16	3432	D13	3512	D15	3564	E15	3605	D4	3632	D5	4301	B16	5609	F5	7206	D8	7529	E15	7626	D5
1410	F2	2201	E11	2307	B15	2417	D15	2442	C14	2520	D17	2618	E2	2644	E8	3120	C9	3314	E13	3433	D13	3513	D16	3566	E15	3606	D4	3633	D5	4304	B11	5610	E9	7207	D10	7531	E15	7627	E5
1420	C2	2202	C11	2309	B15	2418	D15	2443	D13	2521	D17	2619	D18	2645	D7	3123	C11	3401	E13	3434	D14	3514	D16	3574	F17	3608	D6	3635	E5	4305	B11	6500	E15	7220	D10	7535	F17	7628	E5
1421	C6	2203	D9	2311	D13	2419	D15	2444	D14	2532	D16	2620	C18	2646	D6	3125	B8	3411	D15	3435	D14	3515	D16	3579	E16	3609	D5	3637	E5	4500	E16	6501	E15	7221	D9	7537	E16	7629	E5
1422	B2	2204	D8	2312	B14	2420	D15	2445	C15	2533	D17	2624	F4	3100	B9	3200	D10	3412	D15	3436	D14	3516	D16	3580	D16	3612	E5	3639	E10	4501	E16	6603	E6	7222	C9	7538	E16		
1424	A14	2205	D12	2314	D13	2421	E15	2500	D16	2534	E18	2625	D13	3101	B9	3202	D11	3413	D15	3437	D14	3517	C17	3581	E16	3614	D4	3640	E10	4502	E15	6604	F5	7300	B16	7541	E15		
2102	B9	2206	D12	2317	B13	2425	D14	2501	C16	2536	F17	2626	C18	3102	B10	3203	D10	3414	D15	3438	C15	3518	C17	3583	E15	3615	D4	3643	E5	4503	E15	6605	E9	7301	C13	7542	E13		



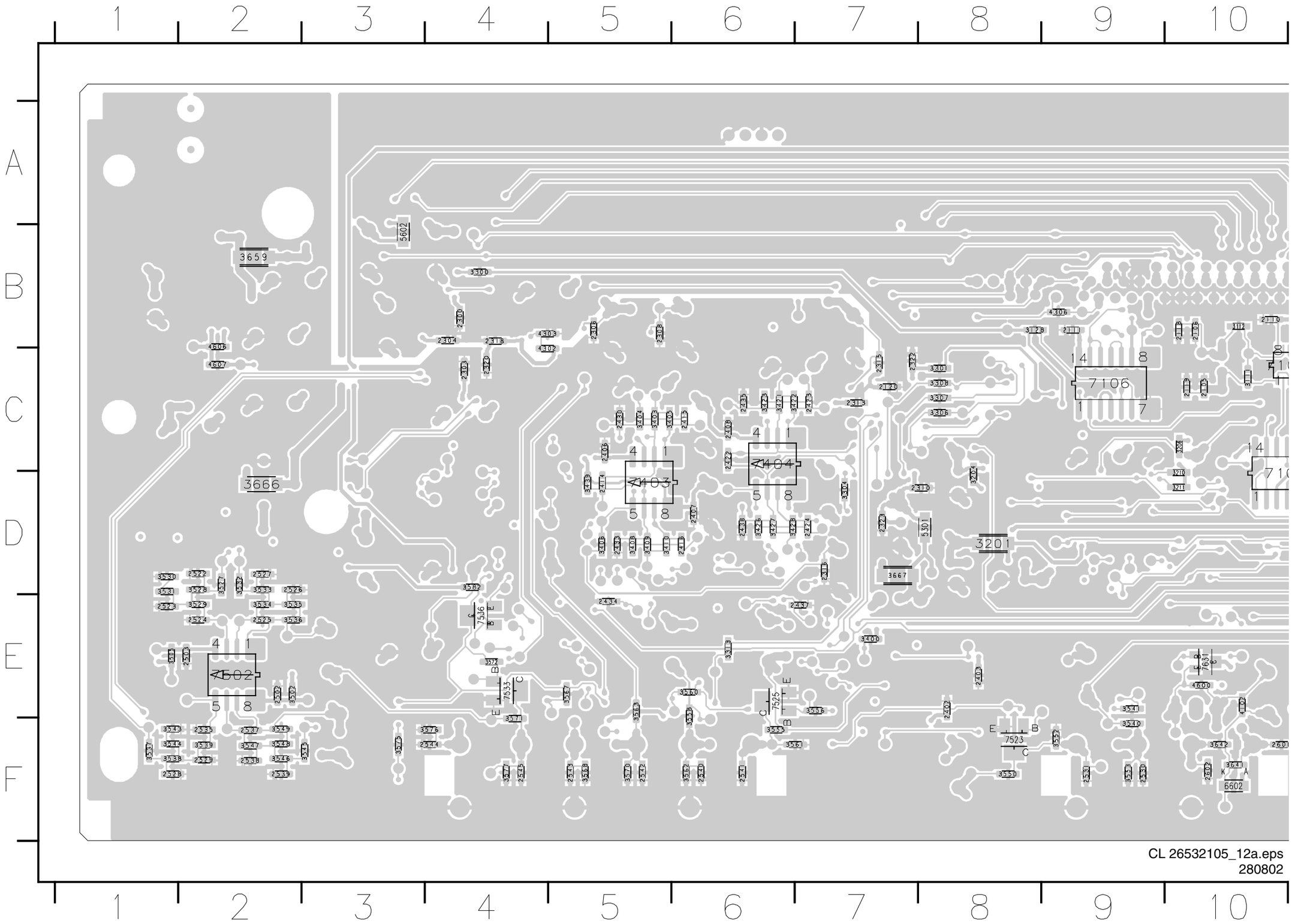
Layout AV-Board (Overview Bottom Side)

2100	B11	2306	B5	2407	D6	2502	E2	2538	F2	2611	F12	3111	C10	3204	D8	3405	C5	3527	D2	3541	E9	3560	E6
2101	B11	2308	B5	2408	C6	2503	E2	2539	F2	2615	E13	3112	B10	3206	C10	3406	D5	3528	D2	3543	F1	3561	F7
2105	C10	2310	D8	2414	D5	2522	D2	2540	F6	2617	F17	3113	B13	3210	D10	3408	D5	3529	E2	3544	F1	3562	F6
2106	B10	2313	C7	2415	C6	2523	E1	2541	F6	2621	F18	3114	C13	3211	D10	3409	D5	3530	D1	3545	F3	3563	E5
2110	B10	2315	C7	2416	D6	2524	E2	2542	F5	2622	F19	3115	C13	3300	B4	3410	D5	3531	D1	3546	F2	3567	E5
2111	B9	2316	D7	2422	C6	2525	E2	2543	F5	2623	F18	3124	A12	3301	C8	3421	C6	3532	D2	3547	F2	3568	F5
2114	C11	2318	B4	2423	C7	2526	D2	2544	F4	2630	F14	3126	A11	3304	D7	3422	C6	3533	D2	3548	F2	3570	F5
2115	D11	2320	C4	2424	D7	2527	D2	2545	F4	2631	F15	3127	A12	3306	C8	3423	C6	3534	E2	3549	F2	3571	F4
2118	B10	2322	C7	2430	C5	2528	F1	2600	B16	2632	F11	3128	B8	3307	C8	3426	D6	3535	E2	3550	F8	3572	E4
2119	C10	2323	D7	2433	D5	2529	F2	2601	F10	2634	D18	3129	D11	3308	C8	3427	D6	3536	E2	3552	F9	3575	F3
2120	C7	2402	E8	2434	E5	2530	F9	2602	F10	2636	D18	3130	D11	3313	E6	3428	D6	3537	F1	3553	F9	3576	F4
2300	B4	2403	E8	2435	C6	2531	F9	2603	F15	2638	D17	3131	A12	3400	E7	3439	D5	3538	F1	3555	F6	3577	F4
2303	C4	2405	E14	2437	E7	2535	F2	2604	F14	3109	B13	3132	A11	3403	C5	3502	E2	3539	F2	3556	E7	3582	D4
2304	B4	2406	C5	2438	D6	2537	F2	2605	F15	3110	B11	3201	D8	3404	C5	3505	E1	3540	F9	3558	E6	3600	C16

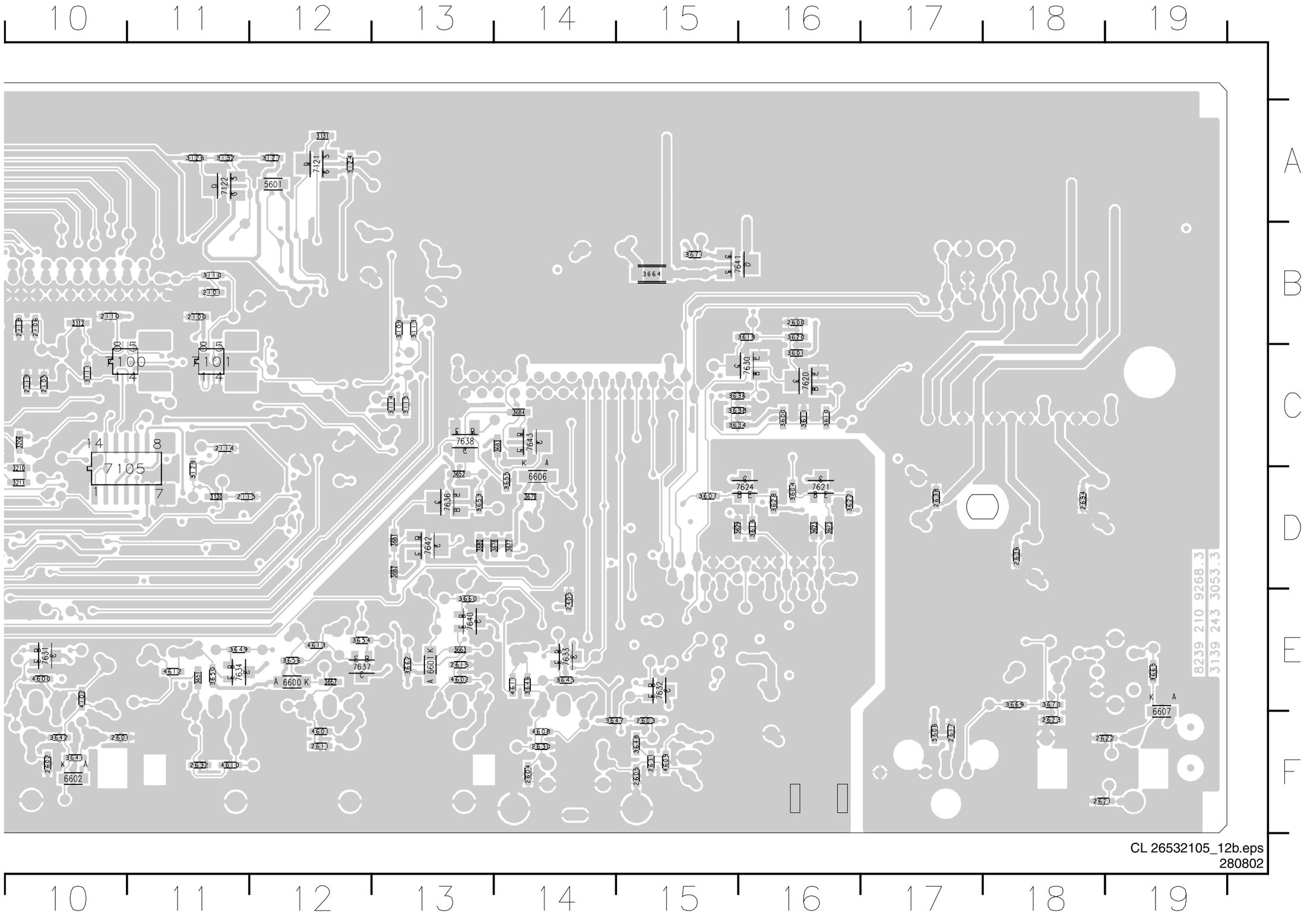
3601	C16	3638	C15	3656	E12	3677	D14	4602	E13	6601	E13	7525	E6	7640	E13								
3604	D16	3641	F10	3657	E12	3678	D14	4606	B2	6602	F10	7533	E4	7641	B15								
3607	D15	3642	F10	3659	B2	3679	D14	4607	C2	6606	D14	7536	E4	7642	D13								
3610	C16	3645	E14	3660	E13	3680	D13	4608	F14	6607	F19	7620	C16	7643	C14								
3611	C16	3646	E14	3662	E13	3681	D13	4609	F15	7100	C10	7621	D16										
3616	D16	3647	F14	3663	E13	3682	D13	4610	F11	7101	C11	7624	D16										
3619	B16	3648	F15	3664	B15	3683	C14	4611	E14	7105	D10	7630	C16										
3620	B16	3649	E11	3665	E19	3684	C14	4612	E11	7106	C9	7631	E10										
3622	D16	3650	E11	3666	D2	4102	E10	4613	E12	7121	A12	7632	E15										
3623	D16	3651	E11	3667	D7	4302	C4	5301	D8	7122	A11	7633	E14										
3628	D16	3652	D13	3669	E18	4303	B4	5601	A12	7403	D5	7634	E11										
3629	D15	3653	D13	3670	E18	4306	B9	5602	B3	7404	C6	7636	D13										
3634	C15	3654	E12	3671	B15	4600	E10	5606	F17	7502	E2	7637	E12										
3636	C15	3655	D14	3673	D16	4601	F12	6600	E12	7523	F8	7638	C13										



Layout AV-Board (Part 1 Bottom Side)



Layout AV-Board (Part 2 Bottom Side)



CL 26532105_12b.eps
280802

Display Panel

DISPLAY PANEL

1111
15-MT-67GNK

SVCD SACD VGA ○ CD ○ STEREO ○ MCH
FTS DIGITAL NATURAL MOTION
DVD VIDEO HD CD PIC
ALBUM GROUP TITLE DTS TRACK PCM CHAPTER MCH SUR INDEX SCAN SHUFFLE TOTAL REM TRACK TIME
3D SPOTLIGHT A-B REPEAT TITLE CHAPTER TRACK ALL
DVD AUDIO

1120
RT-01T
RESERVED

S1
1V / div DC
50us / div

INFO : FIL1 - FIL2 = 3.5 Vac RMS

FROM 1205 STANDBY BOARD

P50 interface to SCART

For EU Models with Double Scart Only

SCART PIN 10

I/O PORT 8 · I/O PORT 7 · I/O PORT 6 · VFT DRIVER CIRCUIT · 8 BIT A/D-CONVERTER · PROGRAM COUNTER · PROGR MEMORY (ROM) · DATA MEMORY (RAM) · INTERRUPT CONTROLLER · SERIAL INTERFACES · 8 BIT TIMER/COUNTER · 16 BIT TIMER/COUNTER · CLOCK/TIMING CONTROLLER (I/O PORT 2) · I/O PORT 0 · I/O PORT 1 · I/O P3 · I/O PORT 4 · I/O PORT 5 · I/O PORT 9 · I/O PORT D

7401
TMP87CH74

7402
TSOP2236
PIN · AGC · PASS BAND · DEM · INP · CIRCUIT CTRL · GND · OUT · VS

NEXT · PAUSE · OPEN/ CLOSE · REPEAT · PLAY · PREV · STOP · AUDIO-MODE · SOUND

SOUND · AUDIO DIRECT · UP SAMPLING · P-SCAN

TO/FROM 1422 OF AV BOARD A1

I117
2V / div DC
10us / div

I121
10V / div DC
10us / div

V DC vtg measured in STOP-MODE

*RESERVED

BARE BOARD : 3139-243-30572

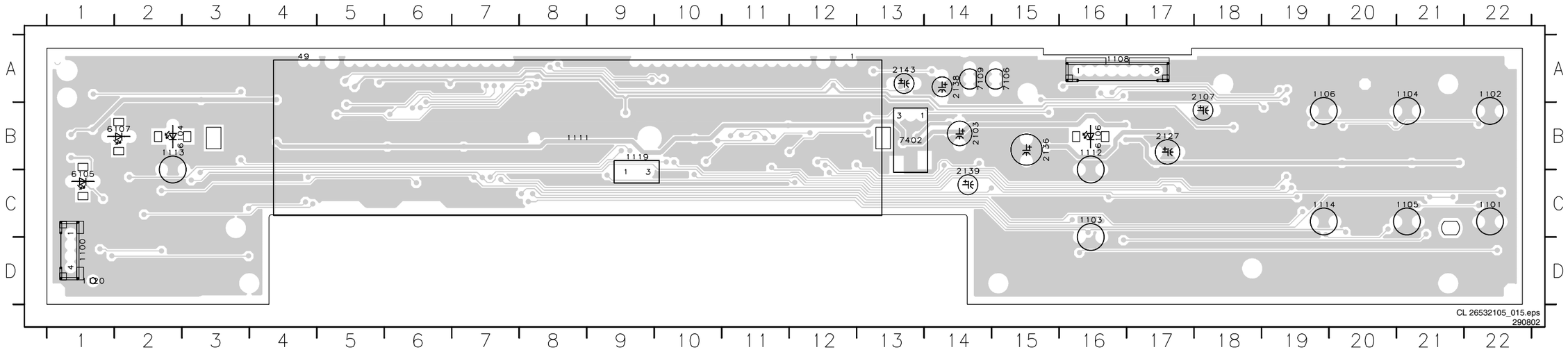
CL 26532105_014.eps
040902

1100 C1 7402 H6
1101 D11 I100 C2
1102 D11 I101 C2
1103 D12 I102 D2
1104 E11 I108 H13
1105 E11 I113 E10
1106 E12 I114 E10
1108 F14 I115 H13
1111 A6 I116 E10
1112 E12 I117 F8
1113 E13 I118 F9
1114 D12 I119 H3
1119 G6 I120 B9
1120 B1 I121 B10
2102 H12 I122 A11
2103 I7 I123 A13
2104 C9 I124 A11
2105 C9 I125 A13
2106 C9 I126 D10
2107 I13 I127 D10
2108 I5 I129 F14
2109 G6 I130 B8
2122 A12 I131 B9
2123 A13 I132 B9
2124 D10 I133 B9
2127 G13 I134 B9
2129 I13 I135 B9
2131 F5 I136 B9
2133 G11 I137 B9
2134 G11 I138 B9
2135 H11 I139 B9
2136 H11 I140 B8
2137 H9 I141 B7
2138 H11 I142 B7
2139 H2 I143 B7
2140 I4 I144 B7
2141 I7 I145 B7
2142 H3 I146 B7
2143 I11 I147 B8
2144 G7 I148 B8
3100 A12 I149 B7
3101 A3 I150 B6
3102 B3 I151 B7
3103 A13 I152 B7
3104 B3 I153 B6
3105 C2 I154 B6
3106 A12 I155 B7
3107 A12 I156 B6
3108 B13 I157 B6
3109 C12 I158 B7
3110 C12 I159 F12
3111 C13 I160 G12
3112 E10 I161 G12
3113 E10 I162 C7
3114 E10 I163 C7
3115 H12 I164 C7
3116 C11 I165 C2
3117 C13 I166 D4
3118 E10 I174 I7
3119 C3 I175 I7
3120 F11 I180 B8
3121 D3 I181 B8
3123 F10 I182 E2
3125 G10 I183 E3
3126 G8 I184 E4
3127 G14 I185 F10
3128 G13 I186 F4
3129 H10 I187 F8
3130 H9 I188 F9
3131 H9 I189 G9
3133 I11 I190 G5
3134 G7 I191 G5
3135 H4 I192 G2
3138 H3 I193 G3
3139 I11 I194 G5
3140 I9 I195 G14
3141 I3 I196 G14
3142 D13
3143 F5
3144 F4
3146 E1
3147 E3
3148 E2
3149 E4
3150 E2
3151 E3
3152 F1
3153 F3
3154 G2
3155 G4
3156 G2
3157 G4
3158 I8
6100 A13
6101 H13
6103 H3
6104 E1
6105 G1
6106 E3
6107 G3
6108 C10
7100 A4
7101 A13
7102 B4
7103 B4
7104 D2
7105 H4
7106 H11
7108 I10
7109 I11
7111 E2
7112 E3
7113 G2
7114 G3
7401 F9

Layout Display Panel (Top Side)

1100	D1	1102	A22	1104	A21	1106	A19	1111	B8	1113	B2	1119	B9	2103	B14	2127	B17	2138	A14	2143	A13	6105	C1
1101	C22	1103	C16	1105	C21	1108	A16	1112	B16	1114	C19	1120	D1	2107	A18	2136	B15	2139	C14	6104	B2	6106	B16

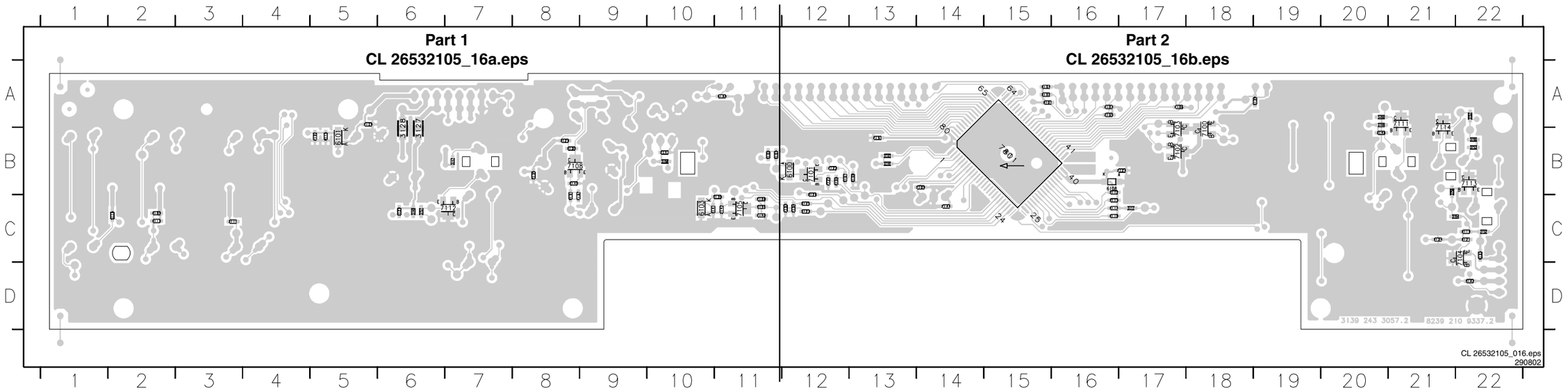
6107	B2	7109	A14		
7106	A15	7402	B13		



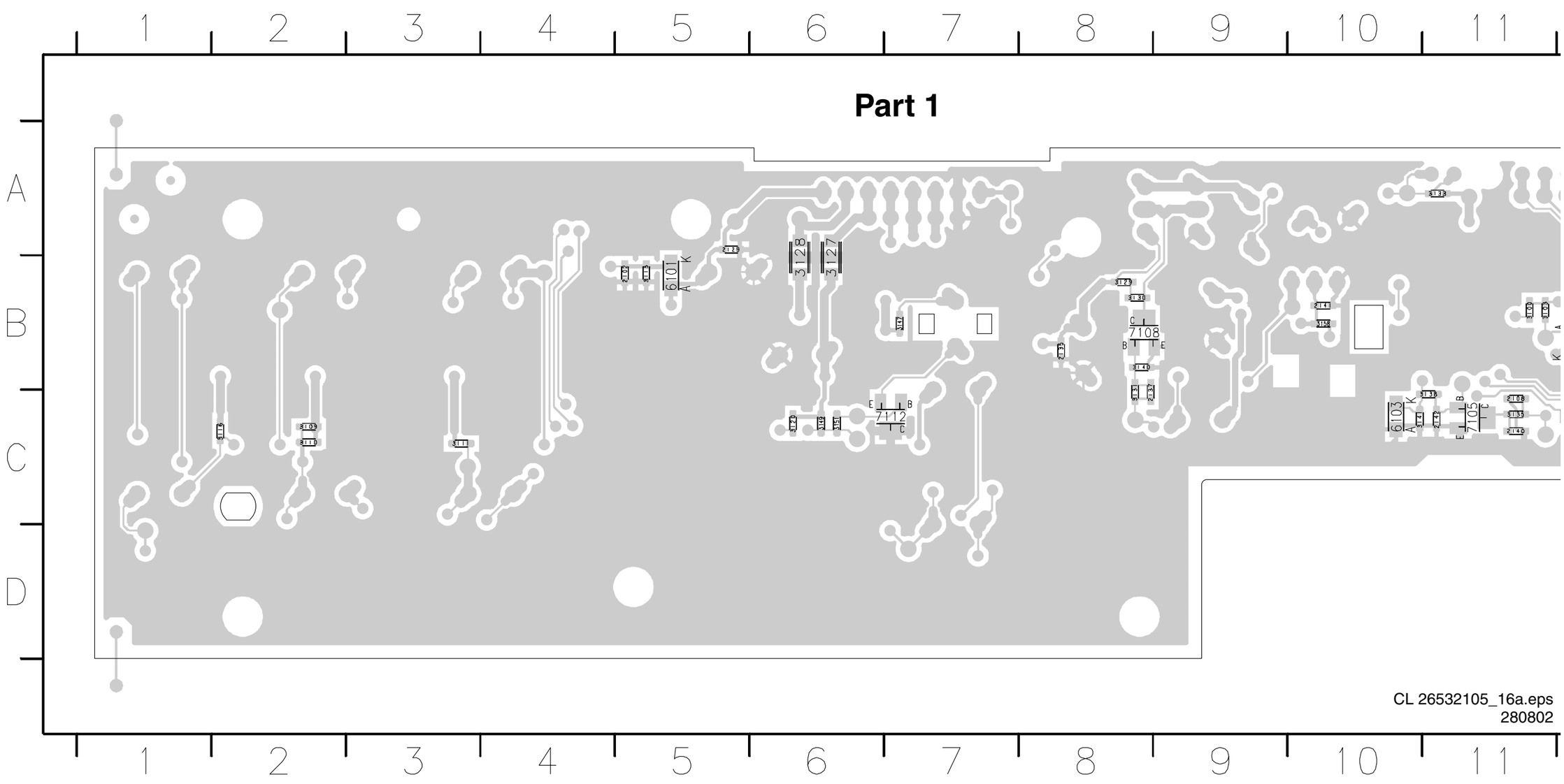
CL 26532105_015.eps
290802

Layout Display Panel (Overview Bottom Side)

2102 B5	2109 B14	2131 B13	2140 C11	3101 A15	3106 B12	3111 C3	3116 C2	3121 C22	3128 B6	3134 C21	3141 C10	3147 B7	3152 C22	3157 A22	6108 B16	7104 C22	7113 B22
2104 A16	2122 B12	2133 C12	2141 B10	3102 A15	3107 B12	3112 B16	3117 C17	3123 C12	3129 B8	3135 C11	3142 D22	3148 A20	3153 B22	3158 B10	7100 B18	7105 C11	7114 A21
2105 A16	2123 B12	2134 C12	2142 C11	3103 B11	3108 B13	3113 C16	3118 C16	3125 C12	3130 B8	3138 C11	3143 B13	3149 C6	3154 C21	6100 B12	7101 B12	7108 B8	7401 B15
2106 A17	2124 B17	2135 B8	2144 C14	3104 A15	3109 C2	3114 C16	3119 C22	3126 B12	3131 C8	3139 A19	3144 B13	3150 A20	3155 B22	6101 B5	7102 B17	7111 A21	
2108 C11	2129 A5	2137 C8	3100 B11	3105 C22	3110 C2	3115 B5	3120 C6	3127 B6	3133 A11	3140 B8	3146 B20	3151 C6	3156 B21	6103 C10	7103 B17	7112 C7	

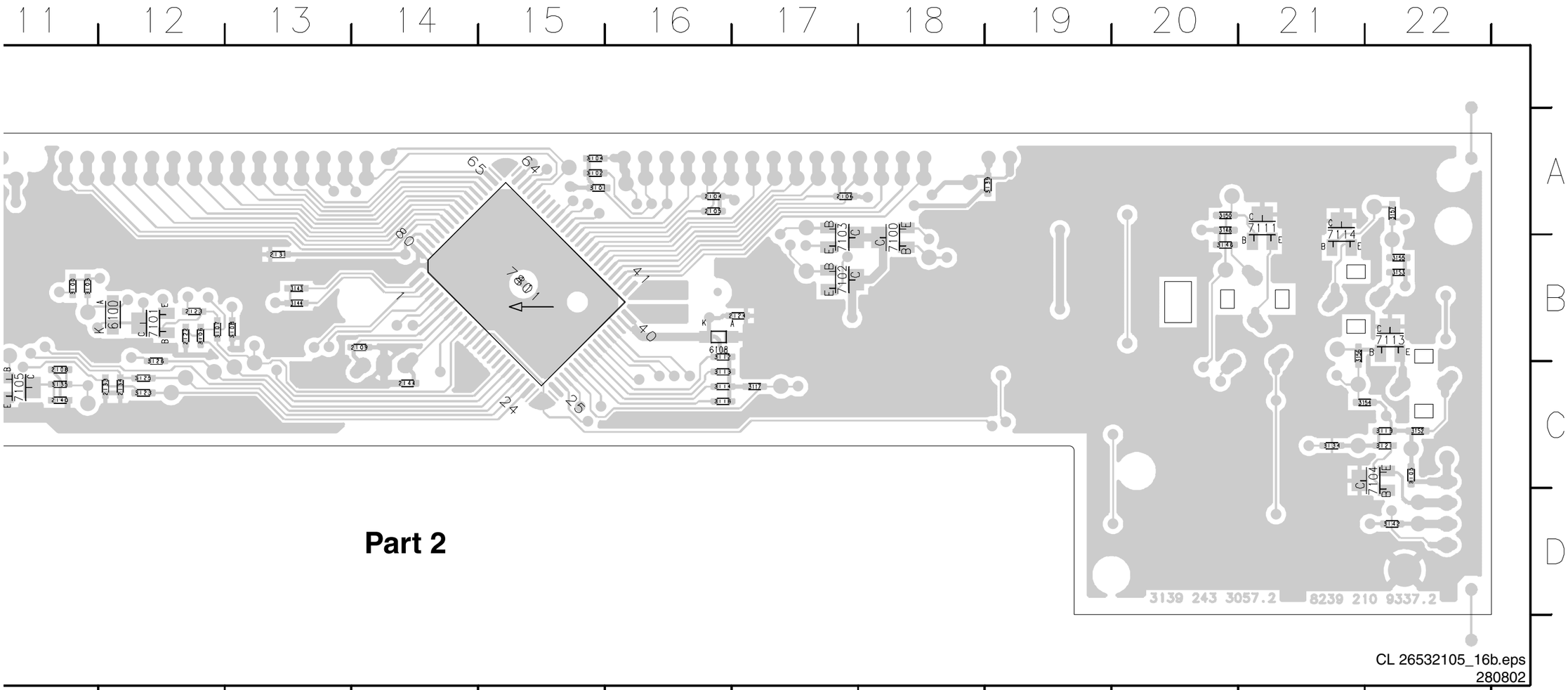


Layout Display Panel (Part 1 Bottom Side)



CL 26532105_16a.eps
280802

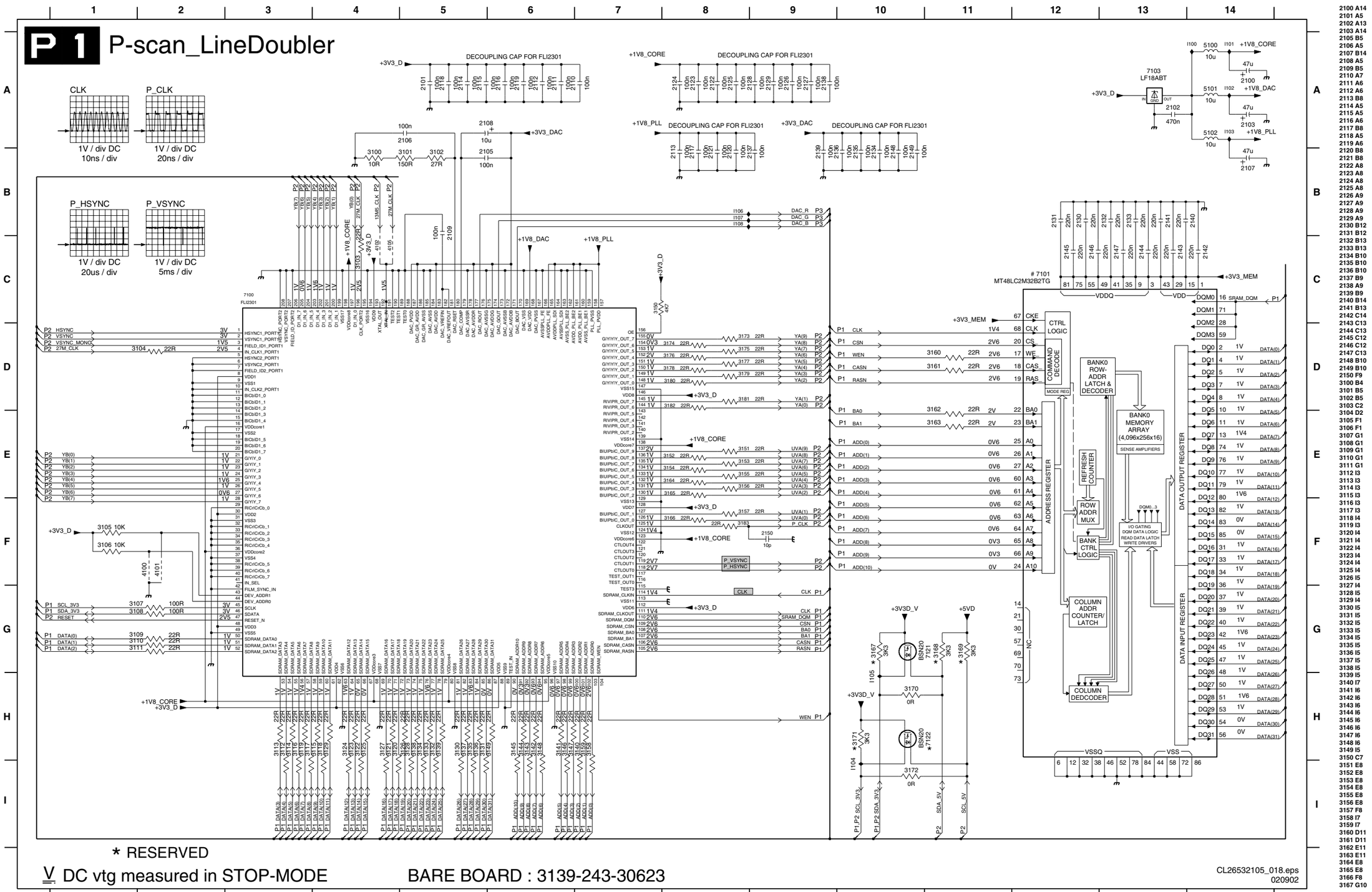
Layout Display Panel (Part 2 Bottom Side)



Part 2

P-Scan Board: Line Doubler

P 1 P-scan_LineDoubler



2100 A14
2101 A5
2102 A13
2103 A14
2105 B5
2106 A5
2107 B14
2108 A5
2109 B5
2110 A7
2111 A6
2112 A6
2113 B8
2114 A5
2115 A5
2116 A6
2117 B8
2118 A5
2119 A6
2120 B8
2121 B8
2122 A8
2123 A8
2124 A8
2125 A8
2126 A9
2127 A9
2128 A9
2129 A9
2130 B12
2131 B12
2132 B13
2133 B13
2134 B10
2135 B10
2136 B10
2137 B9
2138 A9
2139 B9
2140 B14
2141 B13
2142 C14
2143 C13
2144 C13
2145 C12
2146 C12
2147 C13
2148 B10
2149 B10
2150 F9
3100 B4
3101 B5
3102 B5
3103 C2
3104 D2
3105 F1
3106 F1
3107 G1
3108 G1
3109 G1
3110 G1
3111 G1
3112 I3
3113 I3
3114 I3
3115 I3
3116 I3
3117 I3
3118 I4
3119 I3
3120 I4
3121 I4
3122 I4
3123 I4
3124 I4
3125 I4
3126 I5
3127 I4
3128 I5
3129 I4
3130 I5
3131 I5
3132 I5
3133 I5
3134 I5
3135 I5
3136 I5
3137 I5
3138 I5
3139 I5
3140 I7
3141 I6
3142 I6
3143 I6
3144 I6
3145 I6
3146 I6
3147 I6
3148 I6
3149 I5
3150 C7
3151 E8
3152 E8
3153 E8
3154 E8
3155 E8
3156 E8
3157 F8
3158 I7
3159 I7
3160 D11
3161 D11
3162 E11
3163 E11
3164 E8
3165 E8
3166 F8
3167 G10
3168 G11
3169 G11
3170 H10
3171 H10
3172 I10
3173 D8
3174 D8
3175 D8
3176 D8
3177 D8
3178 D8
3179 D8
3180 D8
3181 D8
3182 D8
3183 F8
4100 F2
4101 F2
4102 B4
4105 B4
5100 A14
5101 A14
5102 A14
7100 C3
7101 C12
7103 A13
7121 G11
7122 H11
I100 A14
I101 A14
I102 A14
I103 A14
I104 I10
I105 H10
I106 B8
I107 B8
I108 B8

P-Scan Board: Encoder

P 2 P-scan_Encoder

FROM 1704 of MONO BOARD (M7)

FROM PSU

FOR DEV EVALUATION

FOR PROGRESSIVE ONLY

*RESERVED ⩲ DC vtg measured in STOP-MODE

BARE BOARD : 3139-243-30623

CL 26532105_019.eps
020902

1000 B1
1200 G1
1202 C5
1203 A5
2200 H14
2201 H14
2202 I14
2209 E1
2210 B10
2211 B13
2212 B11
2213 C12
2214 C11
2215 C13
2216 F5
2217 G6
2218 F1
2220 F13
2221 I11
2222 I11
2223 I12
3201 A6
3203 C13
3204 C14
3205 F13
3206 F14
3207 G13
3208 G13
3209 H13
3210 G10
3211 H14
3212 H10
3213 I10
3214 I10
3215 I12
3216 I11
3217 I12
3301 D14
3308 D14
3315 E14
4103 H9
4104 H9
4201 C2
4202 H6
4203 D13
4204 D13
4205 D13
4206 E13
4207 E13
4208 F13
4209 H14
4210 H10
4211 I4
4212 I4
4213 H13
4214 H13
4215 H13
4216 H3
5201 F1
5202 B12
5203 B12
6200 G1
6201 G2
7200-A F5
7200-B G3
7201 A10
7202 C10
7203-A G6
7203-B I3
7203-C I1
7203-D H5
I201 C6
I203 D6
I207 D2
I208 F1
I209 F1
I210 D2
I211 D2
I212 D2
I213 E2
I214 E2
I215 E2
I216 F2
I217 C1
I218 C1
I219 C1
I220 D13
I221 D13
I222 D13
I223 H6
I224 B1
I225 C6

P-Scan Board: Video Output

P 3 Video Output

+VDD_PSCAN
+2V5D
I323 5302 10u I304
+3V3D
+5VD 4302
7300 LF25C
IN GND SHT S20
I302
4301 I303 5303 100u +2V5A_V
2304 1m0 2305 100n
4303 I306 5304 100u +2V5D_V
2307 470n
2308 47u 2309 100n

5309 I319 10u +3V3_DAC
+VDD_PSCAN
5310 10u +3V3_D
5311 10u +3V3D_V
5312 10u +3V3_MEM
2320 47u 2321 47u 2322 47u 2323 47u

+5VD
I307 3314 4R7 I308 I309 +5VA
2314 1m0 2315 47u 2316 100n

P2 Y # 4305
P1 DAC_G 4306
I320 5300 4u7 5301 1u5
3302 1K2 2301 22p 2302 47p 3303 1K2 3304 1K2
3305 1K2
I300 I305
+5VA
2300 100n
7301 AD8061
0V3 3 5 0V3 4 2 1 I301 0V7
3306 1K2
3300 75R I310
2303 100p BZX384-C4V7 6300
1003-A 2YKC21-3930 1 Y
Y

P2 U # 4307
P1 DAC_R 4308
I321 5305 4u7 5306 1u5
3309 1K2 2310 22p 2311 47p 3310 1K2 3311 1K2
3312 1K2
I311 I314
+5VA
2306 100n
7302 AD8061
0V6 3 5 0V6 4 2 1 I312 1V2
3313 1K2
3307 75R I313
2312 100p BZX384-C4V7 6301
1003-B 4 YKC21-3930 3 U
U

P2 V # 4309
P1 DAC_B 4310
I322 5307 4u7 5308 1u5
3316 1K2 2317 22p 2318 47p 3317 1K2 3318 1K2
3320 1K2
I315 I318
+5VA
2313 100n
7303 AD8061
0V6 3 5 0V6 4 2 1 I316 1V2
3321 1K2
3319 75R I317
2319 100p BZX384-C4V7 6302
1003-C 6 YKC21-3930 5 V
V

*RESERVED

V DC vtg measured in STOP-MODE

BARE BOARD : 3139-243-30623

I310 Interlace output / I310 Progressive output / I313 Interlace output / I313 Progressive output / I317 Interlace output / I317 Progressive output / I320 Interlace output / I320 Progressive output / I321 Interlace output / I321 Progressive output / I322 Interlace output / I322 Progressive output
1V / div DC
20us / div
(1.00 V / div DC on I320 Interlace output)

CL 26532105_020.eps
290802

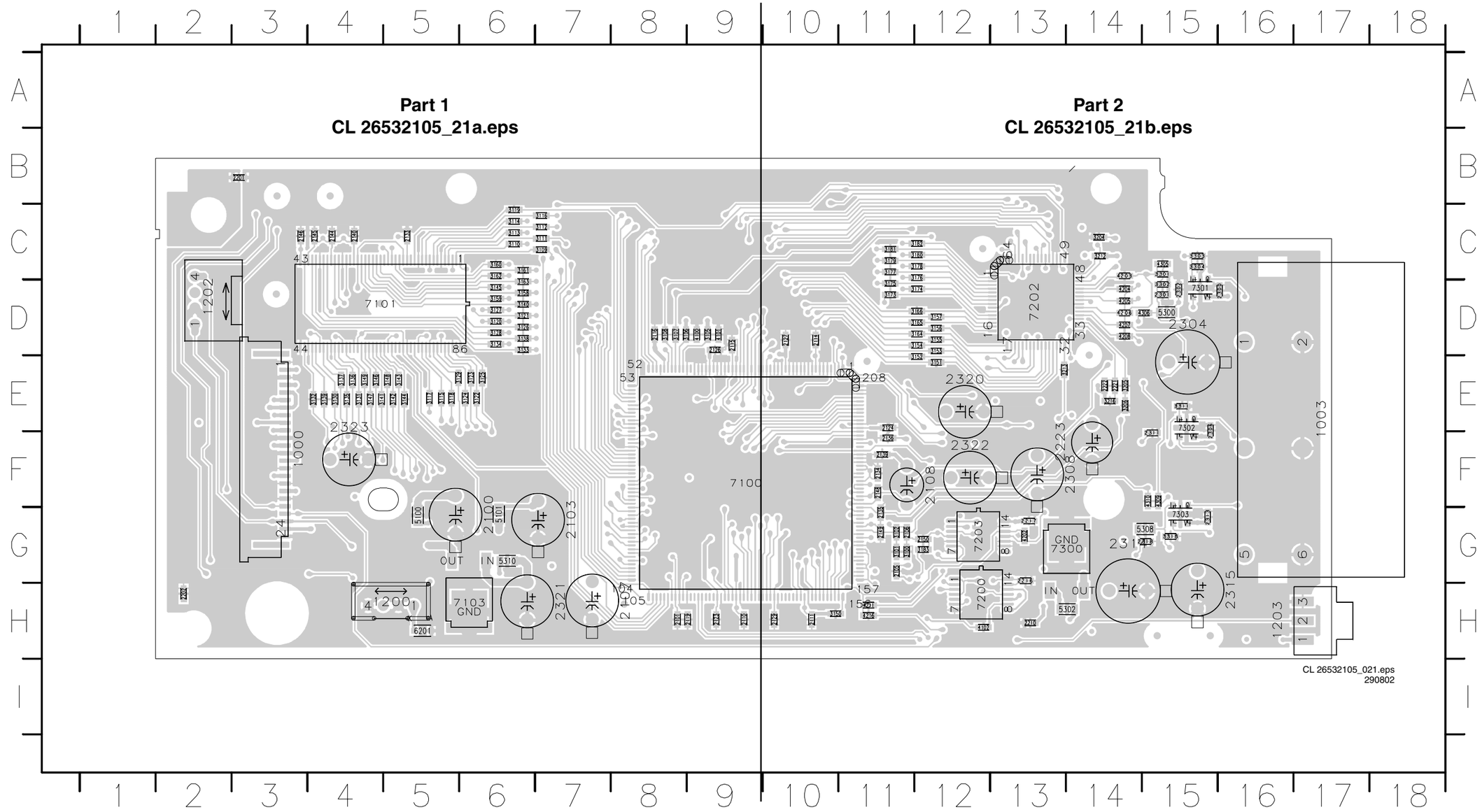
1003-A B9
1003-B C9
1003-C D9
2300 A8
2301 B5
2302 B6
2303 B9
2304 B3
2305 B3
2306 C8
2307 B2
2308 C3
2309 C3
2310 C5
2311 C6
2312 C9
2313 D8
2314 F2
2315 F3
2316 F3
2317 E5
2318 E6
2319 E9
2320 E2
2321 E3
2322 E3
2323 E3
3300 B8
3302 B5
3303 B6
3304 B7
3305 B6
3306 B8
3307 C8
3309 C5
3310 C6
3311 C7
3312 D6
3313 D8
3314 E2
3316 E5
3317 E6
3318 E7
3319 E8
3320 E6
3321 E8
4301 A3
4302 B1
4303 B3
4305 B5
4306 B5
4307 C5
4308 C5
4309 E5
4310 E5
5300 B6
5301 B6
5302 A1
5303 A3
5304 B3
5305 C6
5306 C6
5307 D6
5308 D6
5309 C2
5310 D2
5311 D2
5312 D2
6300 B9
6301 C9
6302 E9
7300 A2
7301 B8
7302 C8
7303 D8
I300 B7
I301 B8
I302 A2
I303 A3
I304 A1
I305 C7
I306 B3
I307 E2
I308 E2
I309 E3
I310 B9
I311 C7
I312 C8
I313 C9
I314 D7
I315 D7
I316 E8
I317 E9
I318 E7
I319 C2
I320 B5
I321 C5
I322 D5
I323 A1

Layout P-Scan Board (Overview Top Side)

1000	F3	2106	G11	2123	H9	2139	F11	2202	H2	2302	D15	2320	E12	3107	D8	3116	C7	3125	E6	3134	D6	3143	E5	3152	E12	3161	C6	3176	C12	3205	E14	3311	E15	4206	D14	5100	G5	7103	H6
1003	E17	2107	H8	2124	E11	2140	C4	2210	H13	2304	D15	2321	H7	3108	D8	3117	E5	3126	D6	3135	E4	3144	E5	3153	D12	3162	C6	3177	C11	3206	E14	3318	G15	4207	D14	5101	G6	7200	H12
1200	H5	2108	F12	2126	D9	2144	C4	2216	G13	2306	E15	2322	F12	3109	C7	3118	E5	3127	D6	3136	E4	3145	D6	3154	D12	3163	D6	3178	C12	3212	C14	4100	D9	4208	D14	5300	D15	7202	D13
1202	D2	2110	H9	2127	D10	2145	C4	2217	G13	2308	F14	2323	E4	3110	C6	3119	C6	3128	D6	3137	E4	3146	E4	3155	D12	3164	D12	3179	C11	3213	E13	4101	D9	4211	H11	5302	H14	7203	G12
1203	H16	2111	H10	2129	H10	2146	C3	2221	E14	2311	F15	3100	G11	3111	C7	3120	D6	3129	E5	3138	D6	3147	E4	3156	D12	3165	D12	3180	C12	3216	E14	4102	H12	4216	H11	5308	G15	7300	G14
2100	G6	2114	D10	2133	C5	2148	F11	2222	E14	2313	G15	3101	G11	3112	C7	3121	D6	3130	E4	3139	E4	3148	E5	3157	D12	3166	D12	3181	C11	3301	C15	4202	G13	4305	C15	5310	G6	7301	D15
2101	H8	2115	D9	2134	F11	2149	G11	2223	F13	2314	G14	3102	G11	3113	C6	3122	E6	3131	E4	3140	D6	3149	E4	3158	D6	3173	D11	3182	C12	3302	D15	4203	C14	4306	D15	6201	H5	7302	E15
2103	G7	2116	D8	2135	G11	2150	G12	2300	D16	2315	H16	3105	D9	3114	C6	3123	E6	3132	E4	3141	E4	3150	H10	3159	D6	3174	D12	3183	G12	3303	C15	4204	D14	4309	F15	7100	F9	7303	G15
2105	G11	2119	H9	2136	F11	2201	B3	2301	D15	2318	G15	3106	D8	3115	E5	3124	E6	3133	D6	3142	E5	3151	E12	3160	C6	3175	D11	3204	C14	3304	C15	4205	D14	4310	F15	7101	D4		

Part 1
CL 26532105_21a.eps

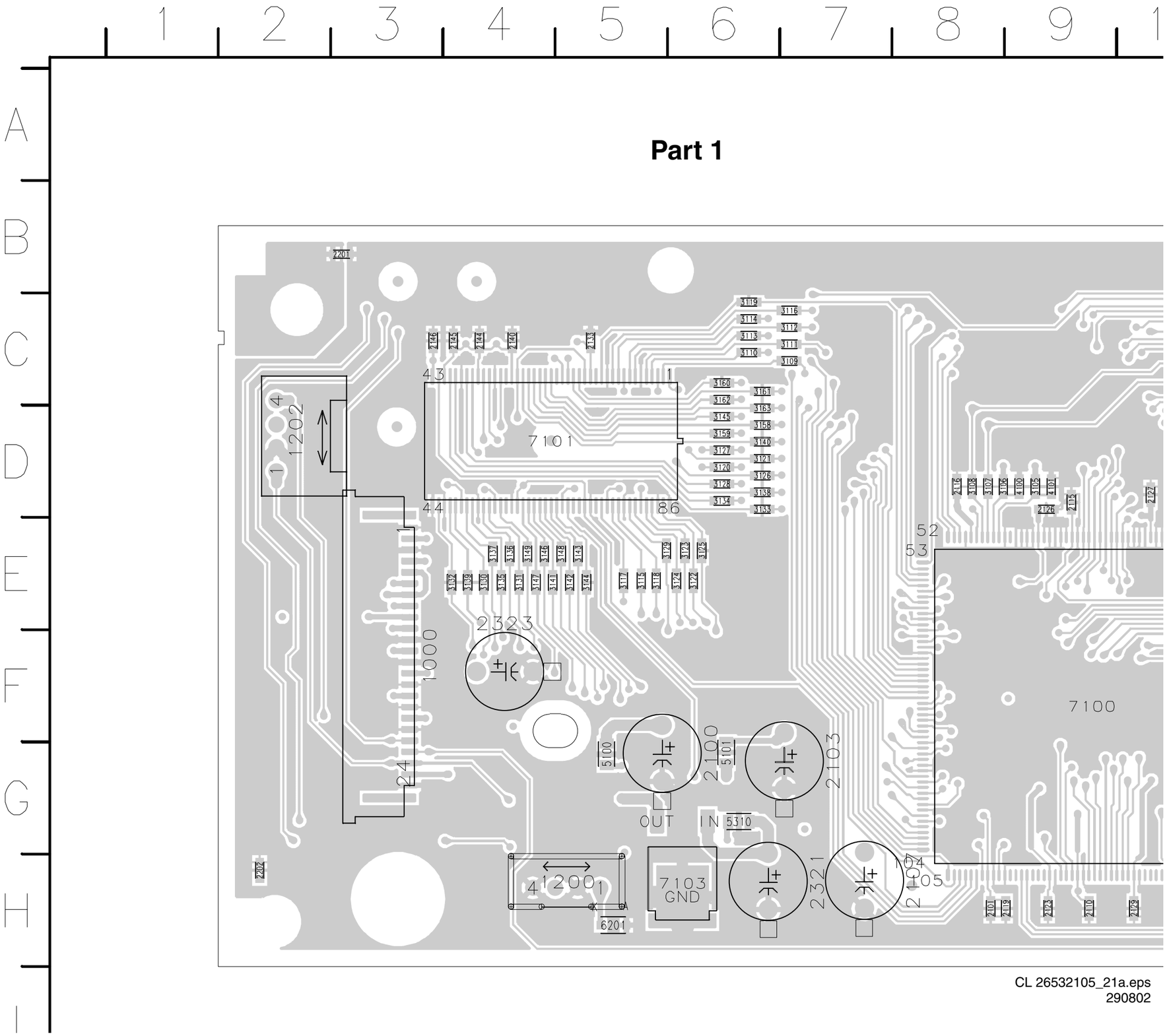
Part 2
CL 26532105_21b.eps



CL 26532105_021.eps
290802

Layout P-Scan Board (Part 1 Top Side)

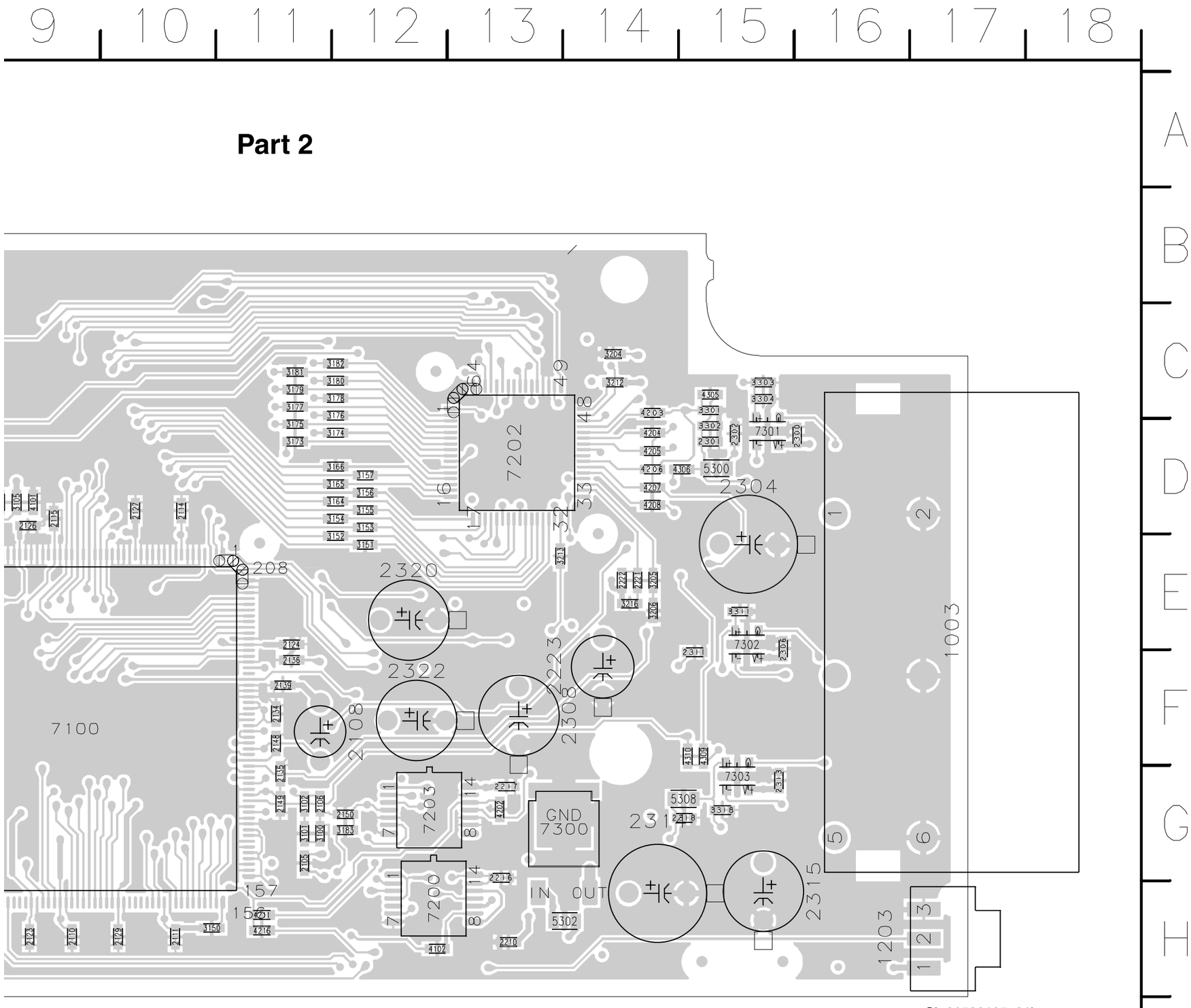
Part 1



CL 26532105_21a.eps
290802

Layout P-Scan Board (Part 2 Top Side)

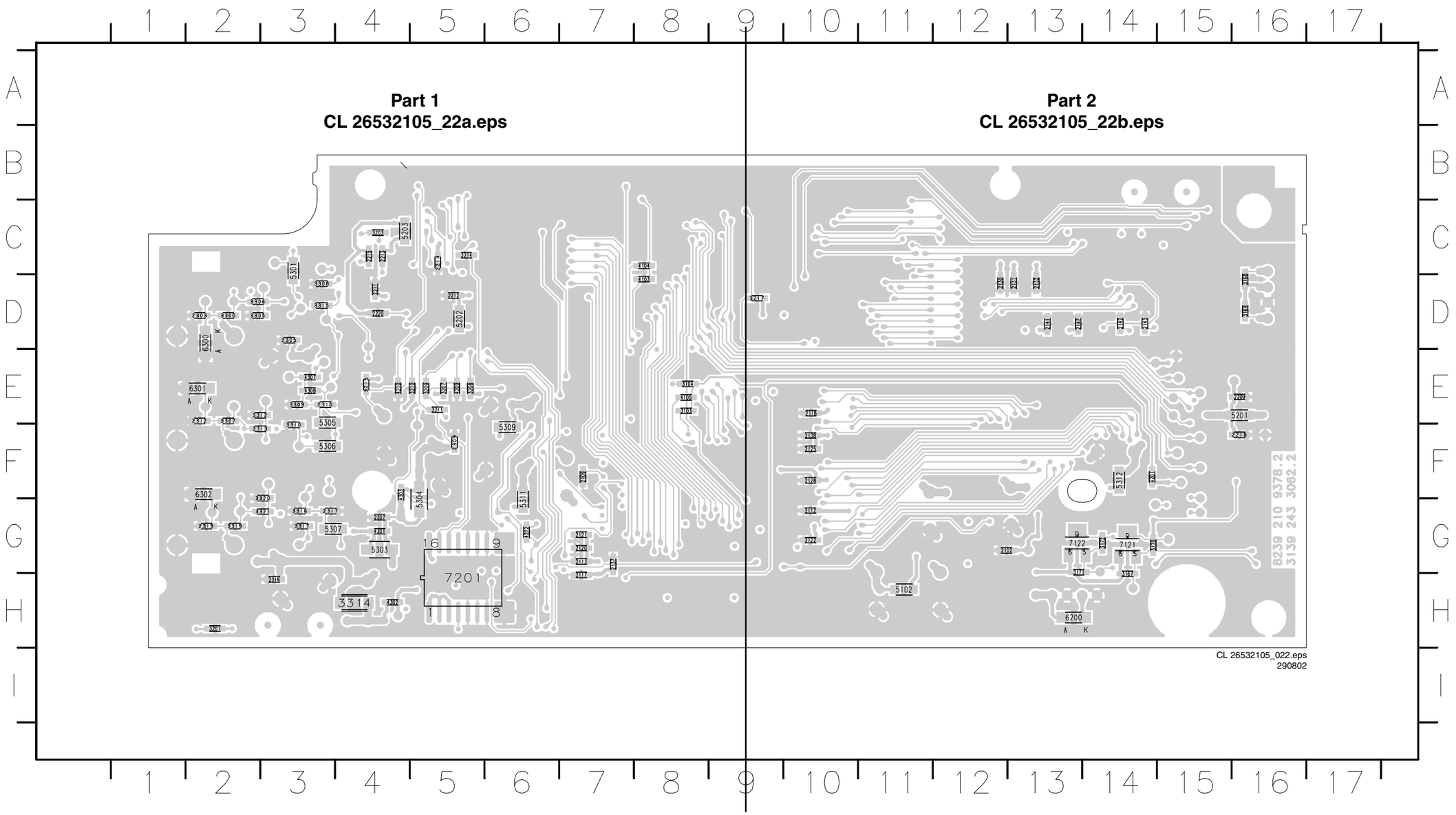
Part 2



CL 26532105_21b.eps
290802

Layout P-Scan Board (Overview Bottom Side)

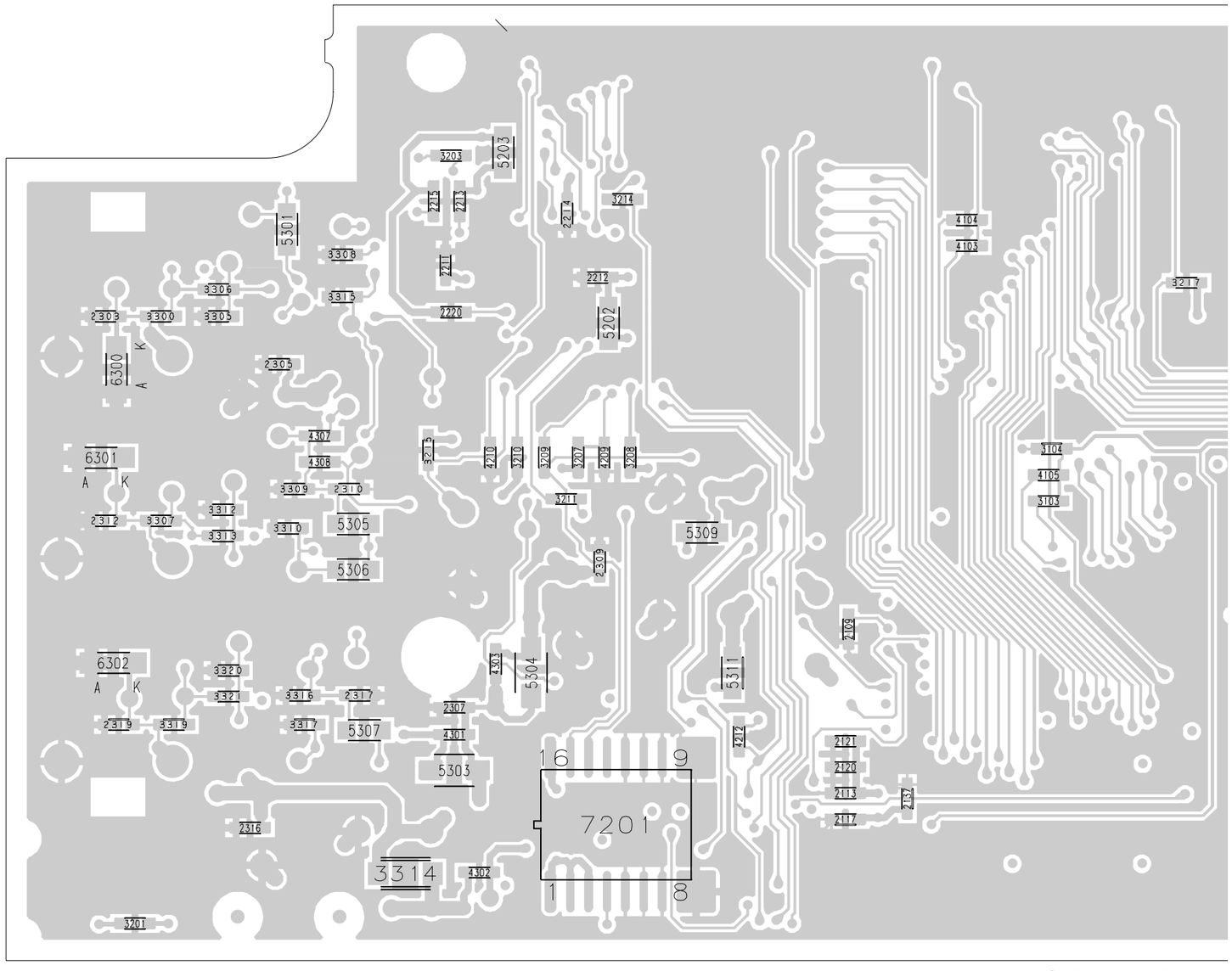
2102	G12	2120	G7	2131	D13	2143	D14	2214	C5	2307	G4	2319	G2	3170	G14	3208	E5	3217	D9	3309	E3	3316	G3	4104	C8	4301	G4	5201	E16	5305	E3	6200	H13	7201	H5
2109	F7	2121	G7	2132	D13	2147	D13	2215	C4	2309	F5	3103	E8	3171	G13	3209	E5	3300	D2	3310	F3	3317	G3	4105	E8	4302	H4	5202	D5	5306	F3	6300	D2		
2112	G10	2122	G10	2137	G7	2209	E16	2218	F16	2310	E3	3104	E8	3172	G14	3210	E5	3305	D2	3312	E2	3319	G2	4201	F14	4303	F4	5203	C4	5307	G3	6301	E2		
2113	G7	2125	F10	2138	F10	2211	D4	2220	D4	2312	E2	3167	H14	3201	H2	3211	E5	3306	D2	3313	F2	3320	F3	4209	E5	4307	E3	5301	C3	5309	F6	6302	F2		
2117	H7	2128	F10	2141	D13	2212	D5	2303	D2	2316	H3	3168	D16	3203	C4	3214	C5	3307	E2	3314	H4	3321	G3	4210	E4	4308	E3	5303	G4	5311	G6	7121	G14		
2118	E10	2130	D12	2142	D14	2213	C4	2305	D3	2317	G3	3169	D16	3207	E5	3215	E4	3308	D3	3315	D3	4103	D8	4212	G6	5102	H11	5304	G5	5312	F14	7122	G13		



CL 26532105_022.eps
290802

Layout P-Scan Board (Part 1 Bottom Side)

Part 1



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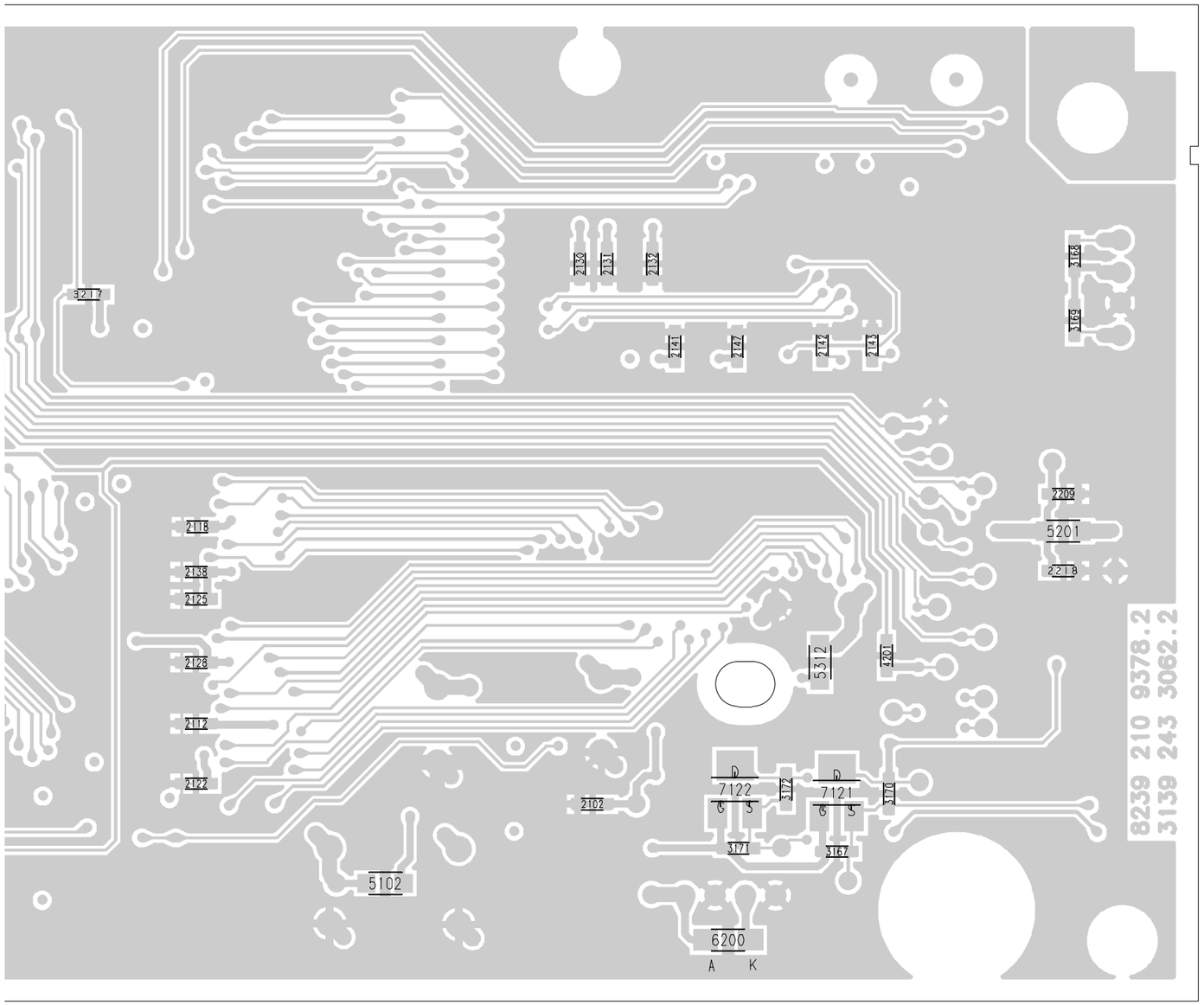
Layout P-Scan Board (Part 2 Bottom Side)

9 10 11 12 13 14 15 16 17

A B C D E F G H I

Part 2



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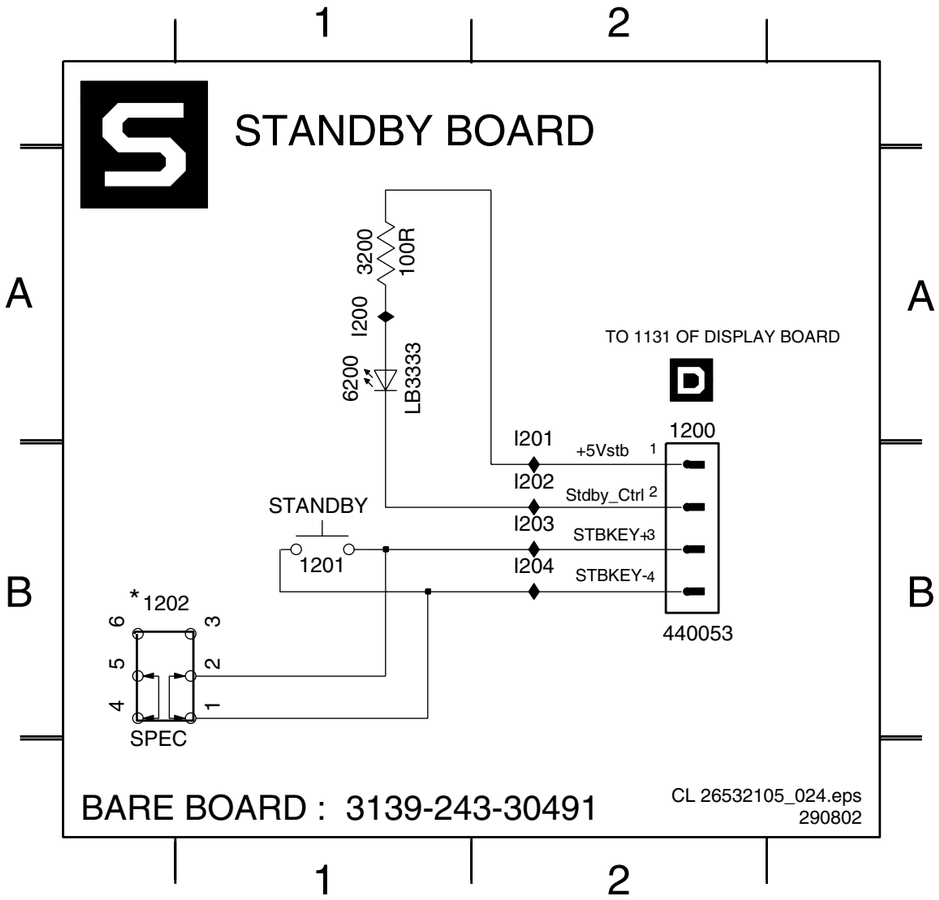
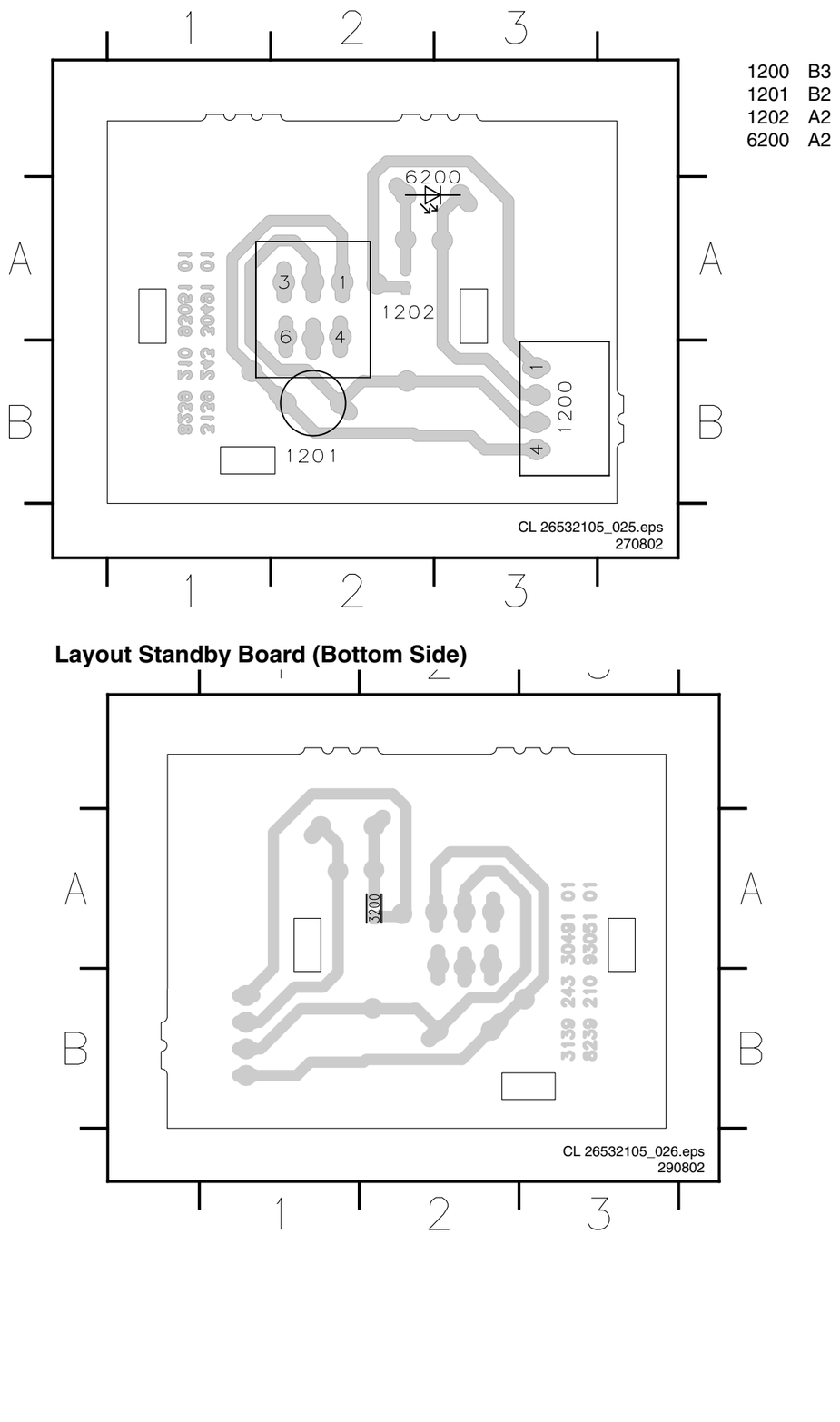
Standby Board



Layout Standby Board (Top Side)



Layout Standby Board (Bottom Side)

Personal Notes:

Personal Notes:

8. Alignments

Not applicable.

9. Circuit Descriptions and List of Abbreviations

Index of this chapter:
1. Introduction
2. Power Supply Unit (PSU).
3. Loader/Mono Board.
4. Audio Video (A/V) Board.
5. Front Display Board.
6. Abbreviations
7. IC Data

Notes:
- See also the SD4.00SA_CH Service Manual (3122 785 12480).
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the diagrams in chapter 6 and 7. Where necessary, you will find a separate drawing for clarification.

9.1 Introduction

The DVD963SA is a model from the SACD 2002 'single disc' range. It uses a 2nd generation Philips SACD mono board, based on the Furore 2 DSD/DST decoder.
Below you will find a circuit description of the several modules.

9.2 Power Supply Unit

9.2.1 Introduction

This supply is a Switching Mode Power Supply (SMPS), which uses the control IC TY720xx to produce pulses to drive the power 'switch' (MOSFET). The TY720xx (IC7130) is a high performance, current mode controller for DC-to-DC converter applications.
The operation frequency varies with the circuit load. When the output power demand decreases, the switching frequency raises, with a maximum frequency of 125 kHz (defined by C2130 at pin 5). At this point, the internal VCO takes over and starts to decrease the switching frequency.
This has some benefits compared to a 'fixed frequency' flyback converter. The efficiency is better, which results in a lower power consumption.

9.2.2 Output Voltages

The following output voltages are present on connector 0201:
- Pin 1 and 2: +3V3.
- Pin 4: +12V
- Pin 5: +12STBY.
- Pin 7: +5V.
- Pin 9: -12V.
- Pin 11: -32V.

Note: The suffix 'STBY' indicates that the supply is not switched 'off' during Standby Mode. Power switching is done with the STBY_CTRL signal from the slave processor.

9.2.3 Operation

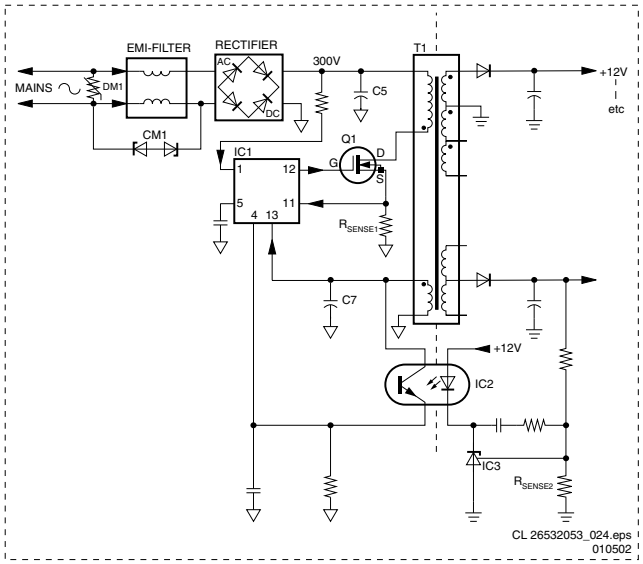


Figure 9-1 Power Supply

Mains Input Circuit
The bridge rectifier D6110 rectifies the mains voltage, after which C5 (2117) smoothens it. The DC voltage across this capacitor is the DC input voltage (approximately 300V), to pin 1 of transformer T1 (pin 9 of 5190) and pin 1 of IC1 (7130). The mains input also consists of a (differential mode) lightning protection DM1 (R3110) and a (common mode) lightning protection CM1 (D6114/15).

Start-up Circuitry
The rectified voltage from the bridge rectifier is connected to pin 1 of IC1. This voltage will charge the Vcc capacitor C7 (C2131). When this voltage, (at pin 13), reaches the start-up threshold of min. 15V, the control circuit starts to operate. After start-up, the control IC requires a sinking current, which the start-up circuitry cannot deliver. Therefore a take-over circuitry (a coupled winding of transformer T1) is present. The voltage at this point will take over the supply voltage at pin 13 of the IC1(7130).
If the take-over circuit does not function, IC1 (7130) will switch 'off' again at the minimal operating voltage of +8V. The whole operation cycle will repeat itself with audible hiccup sound if take-over is not present.

Secondary Voltage Sensing
The secondary voltage regulating circuit comprises of opto-coupler IC2 (7190), which isolates the error signal from the control IC on the primary side, and a reference component IC3 (7290, TL431).

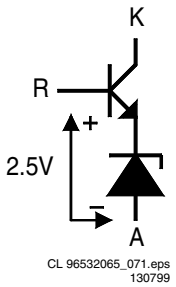


Figure 9-2 TL431

This reference component has two functions:
- A very stable and accurate reference diode
- A high gain amplifier.

When the output voltage increases (due to a reduction in the load), the voltage across $R_{SENSE-2}$ (R3290/R3291) increases to above the internal reference voltage of 2.5V. The TL431 will conduct and the current through the opto-coupler will increase. This results in an increase of the voltage at pin 4 of IC1, which will reduce the 'on' time of Q1 (FET 7125). In the event of an output voltage decrease (due to an increase in the load), the control circuit will operate in the opposite way.

Primary Current Sensing
The current through FET Q1 will result in a voltage drop across RSENSE-1 (R3120-23). This line goes to pin 11 of IC7130, which is the current sense input. The higher the input voltage, the more the primary current is limited. In this way, the maximum output power of the power supply is limited.

Under-voltage Protection
If the supply voltage at pin 13 of IC7130 drops below 7.2V (typical), e.g. due to a shorted secondary voltage or excessive load, the drive pulse at pin 12 is disabled and the controller will switch 'off'.

Over-voltage Protection
An internal over-voltage protection circuitry continuously monitors the Vcc pin. If, after start-up, this voltage exceeds 40V, the internal latch circuit is triggered, the output buffer is disabled, and the SMPS goes into over-voltage protection. Now a complete restart sequence is required.
Note: If the event of the over-voltage situation remains present, the SMPS will go in sequence of protection, start-up, protection and the cycle repeats. This effect is highly audible.

9.3 Loader/Mono Board (for diagrams see SD4.00SA_CH Service Manual)

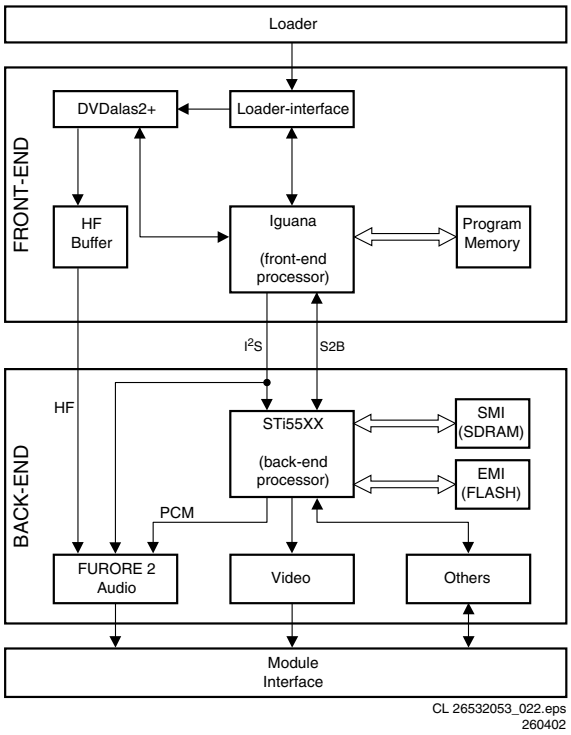


Figure 9-3 Block Diagram Loader/Mono board

The SD4.00_SA_CH (SACHI_4) is the 2nd generation Philips Architectural Standard Design of SACD mono board based on Furore 2, and will be used in the new generation of SACD players. It is designed in a multi-task way so that it can support the following optional main functions:
- SD4.00_SA_CH: Support SACD player with 5-disc changer.
- SD4.00_SA: Support SACD player with single-disc.
- SD4.00_CH: Support DVD player with 5-disc changer but without SACD playback.
- SD4.00_SA_I^2C: Support SACD player with single-disc and I^2C slave.

The SD4.00_SA_CH (SACHI_4) module consist of the following key components:
1. OPU: Mercury 2 Loader VAL6011/14 (slim type) for a single-disc SACD player, or DVD VAM6001/14 mechanism for a 5-disc SACD changer.
2. **Front-end:** M2 Basic Engine.
3. **Back-end:** DVD Host Processor STi55xx and Furore 2 SACD DSD/DST decoder.
4. **Power supply:** To convert the PSU voltages to the correct values.
5. **Reset circuit:** This circuit that the booting of the several devices on the mono board takes place in the correct order.

9.3.1 The Optical Pick-up Unit (OPU)

The Mercury 2 Loader has an optical unit consisting of two lasers:
- One for CD with a wavelength of 780 nm.
- One for DVD with a wavelength of 650 nm.

The TZA1033 (item 7105) controls the data from these lasers, and the supply to them.

9.3.2 Front-end: the Servo Part

The front-end consists of:
- The Loader interface

- The Servo Processor/Decoder
- The Interface/Program Memory

The Loader Interface

The TZA1033HL/K2 (or DVDALAS2plus, item 7105) is an analogue pre-processor and laser supply circuit. It contains data amplifiers and several options for radial tracking and focus control.
It is possible to optimise the dynamic range of this pre-amp/processor combination for the LF servo and RF data paths. The gain in both channels is separately programmable. This will guarantee an optimal playability for all kind of discs.
Also, a dual laser supply is implemented, with fully automatic laser control including stabilisation and an ON/OFF switch, plus a separate supply pin for power efficiency.

The Servo Processor/Decoder

In the SD3.0 module, the servo signals were fed to the MACE2 servo processor, while the HF output signal was fed to the SAA7335 decoder. In the new SD4.0SA_CH module, these ICs are combined into one chip: the SAA7812 Iguana.
This chip contains the following blocks: channel decoder, block decoder, servo processor, and microcontroller.
The servo circuit in the SAA7812 (item 7207) takes care of the servo controls.
In a CD system, there are some twelve control loops active. About six of them are needed to adjust the servo error signals that is once per disc rotation. It also adjusts offsets, signal amplitudes, and loop gains (AGCs), to enlarge system robustness and to avoid expensive potentiometer adjustments in production.
The other six loops determine the laser spot position on the disc in the radial, axial (focus), and tangential directions.
It also has to take care that the spot accesses a required position as fast as possible. This access system consists of two parts, namely the actuator and the sled, which are (within a certain range) mechanically and electrically independent. Therefore, during an access, the servo has to control as well the actuator as the sled.
The analogue signals, from the diode pre-processor, are converted into a digital representation using A/D converters.
For the communication between the host processor (STi55xx) and the servo processor, the S2B bus is used. This bus supports full-duplex asynchronous communication.

The SAA7812 is also a combined CD/DVD compatible decoding device. The device operates with built in hardware for CD/DVD error correction and de-interleaving operations. It decodes EFM or EFM+HF signals directly from the laser pre-amplifier, including analogue front-end, PLL data recovery, demodulation, and error correction.

Its analogue front-end input (the channel decoder), converts the HF input signal to the digital domain via an 8-bit ADC, preceded by an AGC circuit to obtain the optimum performance from the converter. An external resonator clocks this block.
This subsystem recovers the data from the channel stream. It corrects asymmetry, performs noise filtering and equalisation, and finally recovers the bit clock and data from the channel using a digital PLL.
The demodulator part detects the frame synchronisation signals and decodes the EFM (14 bit) and EFM+ (16 bit) data and sub-code words into 8-bit symbols. Via the serial output interface, the I^2S data (audio and video) go to the DVD decoder STi55xx.

The spindle-motor interface provides both motor control signals from the demodulator and, in addition, contains a tachometer loop that accepts tachometer pulses from the motor unit. They drive the motor IC (BA6665FM, item 7300).

The SAA7812 has two independent microcontroller interfaces. The first is a serial I^2C-bus and the second is a standard 8-bit multiplexed parallel interface. Both of these interfaces provide access to 32 8-bit registers for control and status.

The Interface/Program Memory

The interface between front-end (SAA7812) and back-end (Sti55xx) is via:
- I^2S bus (BCLK, DATA, WCLK, FLAG, SYNC and V4).
- S2B bus (RXD_S2B, TXD_S2B, CPR_S2B and SUR_S2B).
- Miscellaneous I/O ports (RSTNF= front-end reset, EANF= front-end processor boot select).

Service tip: These lines contain series resistors (47 or 100 Ω) for easy hardware debugging, and for EMC/noise reduction of the high-speed I^2S lines.

The front-end processor SAA7812 (Iguana) has two boot modes: normal boot from flash memory, or serial mode.
The boot selection is via the EANF pin. The Iguana, samples the EANF signal level once during boot-up. Once boot-up is completed, this pin is no longer used for this purpose.
However, in the SD4.0SA_CH circuit, the EANF is also connected to the flash memory. Therefore, when this pin is LOW, the lower 1 Mbits of the memory is accessible. Conversely, when this pin is HIGH, the upper 1 Mbits is accessible.
Under front-end normal operation, the program memory (less than 1 Mbits in size) should reside in the lower bank. Therefore, the EANF pin should be LOW at all times. Since the actual flash memory used is 2 Mbits, the upper 1 Mbits is unused. This area is reserved for possible use by the front-end self-diagnostic software, or flash download application.

9.3.3 Back-end: the Digital Part

The back-end consists of:
- DVD back-end processor
- SACD DSD processor
- Audio output
- Video output
- Clock factory
- Miscellaneous

DVD Back-end Processor

The SD4.0SA_CH is designed for the Sti55xx family. Some of the DVD related features of these ICs are:

Processor overview

Function	STi5580	STi5588	STi5519
Basic CD/VCD/DVD decoding	X	X	X
Extra 2-channel of I2S output (PCMDATA3)	X	X	
Karaoke	X	X	
DTS	X	X	
Audio post processing (equalizer, level meter, etc)		X	
DVD audio		X	
Progressive scan at analog video output		X	

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Figure 9-4 Processor overview

The STi5580 has the same architecture as the STi5508 (used in earlier DVD generations), and is pin-to-pin compatible.
It works on 3.3 V (V_{DD}), and comprises the following functions:
- Video decoder, which supports MPEG1 and MPEG2.
- Audio decoder that supports AC-3, MPEG1, MPEG2, DTS, PCM, S/PDIF, and MP3.
- PAL/NTSC video encoder with simultaneously Y/C, CVBS, and RGB/YUV outputs.
- The video encoder supports Closed Caption and allows MacroVision 7.0/6.1.
- Full screen On Screen Display (OSD) generator.
- Three on-chip PLLs to generate all necessary clocks (as reference the 27 MHz video clock is used).

Input
Input data comes from the I^2S-bus. The front-end interface of this device, accepts DVD, CD and CD-DA information.

Signal Processing
For video, the input data stream is decoded to the appropriate MPEG, Sub Picture, and OSD data streams, after which they are fed to the PAL/NTSC encoder. This cell will convert the digital MPEG/Sub Picture/OSD stream into a standard base band signal and into RGB components. It handles interlaced and non-interlaced data, can perform CC/TXT encoding, and allows MacroVision copy protection.

For audio, the processing cell is a fully compatible DTS, Dolby Digital (AC-3), MPEG1, MPEG2, PCM decoder, capable of decoding 5.1 and 2 channel streams.

Output
For video, six analogue output pins are available on which CVBS, S-VHS (Y/C), and RGB signals are present. They go, via a buffer, to connector 1703. As an option, a digital YUV output is available at connector 1704.

External Memory
The STi55xx family is capable of accessing external memory via three buses:

- **The enhanced memory interface (EMI).** This interface is configurable and can be used to access Flash, ROM, and various flavours of DRAM.
- **The shared memory interface (SMI).** The SMI is only used to access SDRAM. The SMI is connected to a 64Mbits (4M x 16bit) 7.5ns SDRAM (item 7500). The SDRAM has the following functions:
  - It is used by the MPEG video decoder as a frame buffer,
  - It holds the software and the variables used by it.
- **The I^2C bus.** Via this bus, the NVRAM (or EEPROM) is accessible. This memory is used to store user settings, player settings, and region code. As the STi55xx I/O-lines are potentially unable handle 5V inputs, a voltage level shifter is foreseen for all I^2C-busses. This circuit will isolate the STi55xx I^2C ports (3.3V) from the system I^2C bus (5V). See figure below.

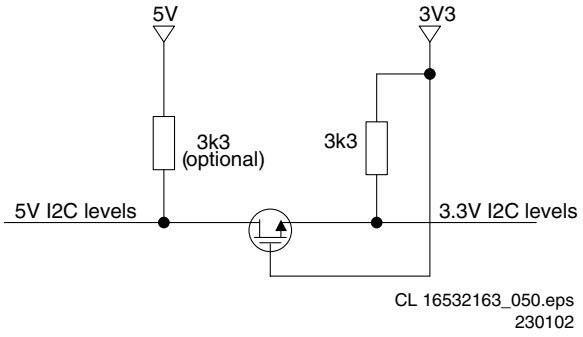


Figure 9-5 I^2C voltage level shifter

The SACD DSD processor
The Furore-IC is a one-chip design, containing all the hardware that is required for SACD processing. It is intended to interface with the STixx-family DVD video decoders.
The Furore-IC contains a memory interface to support an external 16 or 64 Mbit SDRAM.
During SACD application, the STi55xx serves as a host, whereby the Furore is controlled via the EMI interface. The Furore processing part is not used during all other play modes. In these modes, the PCM audio signals are fed through the Furore to the appropriate DAC.

Block diagram

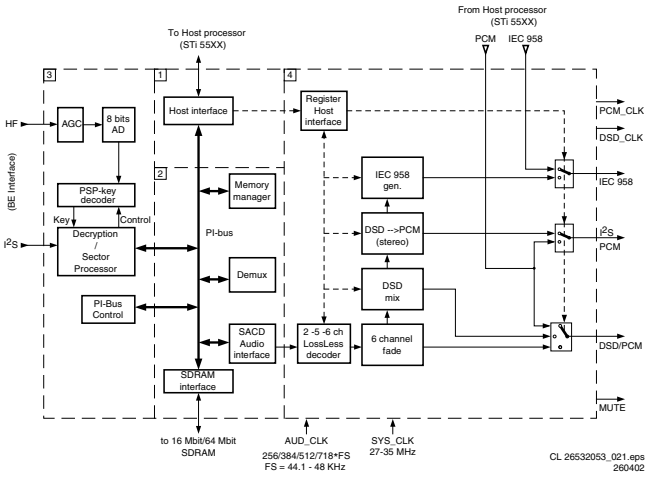


Figure 9-6 Block diagram Furore

We can divide the Furore-IC in four main parts (see block diagram):

1. **Host interface.** This is the link between the host bus and the internal registers and memory bus. It also supplies the general reset signal (HW and SW) and the interrupt signals.
2. **Data processing.** All modules and peripherals in this part are connected to a so-called PI-bus. It is beyond the scope of this manual to go more in detail on this subject.
3. **Copy protection.** On every SACD disc, a PSP-signal is recorded. The player can only play a disc if a valid PSP-signal is detected. This PSP-key is recorded, via a special mechanism, in the EFM-signal on the disc. To detect this key, the analogue HF-signal from the optical pick-up unit is fed directly to the Furore-IC. Via an AGC, the signal is fed to an ADC. The digitised HF signal is then fed to a block where key is encrypted. Control of this process is done via the host interface (sector processor).
4. **DSD decoding and post processing.** In this part, all processing is done to generate a DSD and/or an I^2S stream (from the de-multiplexed stream coming from the data processing block), in such a way that it can directly be connected to a DA-converter. All processing is done on 384*FS.

Interfaces

- **Basic Engine Interface:**
  - Data input interface. The Basic Engine Interface (I^2S) is connected to the output of the SAA7335 (HD61) high speed CD decoder.
  - Analogue HF input. The analogue HF input, coming from the optical pickup unit (OPU), is also fed to the Furore-IC, to extract the copy-protection information PSP (Pit Signal Processing = invisible data is stored on to disc, which is required to decrypt the encrypted content).
- **SDRAM Interface:** The SDRAM interface forms a glue less interface to one 64 Mbit SDRAM device. The interface takes care for the power-up sequence, mode programming and refreshing of the SDRAM devices. This is hard coded in the interface and does not have to be controlled by the host.
- **Audio data input/output Interface:**
  - DSD/PCM combined data output. DSD_PCM: Output intended for a combined 6-channel DSD (SACD) and PCM (DVD-CDDA) DAC. Switching between the PCM data coming from the STi55xx, and the internal generated DSD signals, is done in the Furore IC.
  - Stereo DSD only output. DSD_stereo: 2-channel DSD output with stereo down mix in the case of 5- and 6-channel, and normal stereo in case of 2-channel DSD mode.

– Stereo PCM data output. Two possible stereo sources can be selected as stereo PCM output:
  1. Stereo PCM coming from the STi55xx via the PCM input on Furore.
  2. Stereo or down-mix-PCM derived via a decimation filter from the SACD-DSD signal.
– Digital audio output interface (IEC958). The IEC958 format is intended to connect the DVD736SA to a digital receiver. No DSD signals are defined for IEC958, therefore the 'DSD-->PCM converted' signal is transmitted. Following two types of signals are possible on the digital interface:
  1. IEC958 data coming from the STi55xx.
  2. IEC958 data (stereo or down-mix-PCM) derived via a decimation filter from the SACD-DSD signal.
– Clock + reset input. Two different processing clocks and a reset pulse are needed:
  1. Sys_clk: System clock for data processing part, frequency can be 27 MHz or 768*FS.
  2. 384*FS: Processing clock for LLD and post processing.
  3. RESETn is an asynchronous reset and should be low for at least 1 period of DSD_CLK.

Memory

- **SDRAM.** The size of the SDRAM is 64 Mbit (items 7500 and 7502). It has the following functions:
  – It is used by the MPEG video decoder as a frame buffer,
  – It holds the software and the variables used by it.
- **Flash-ROM.** Two 2MB Flash-ROMs (items 7402 and 7403) hold the DVD firmware, and are controlled by pin 16 (FLASH_OEN) of the STi55xx. It must be able to perform a download (by disk or OS-link) in a Flash-only system.
- **EEPROM.** User settings, player settings, and region code are stored in a 32 Kb I^2C EEPROM.

Audio Output

The audio interfaces available in SD4.0SA_CH are I^2S and S/PDIF for digital audio output, and I^2S karaoke microphone input.
In SACD player, two types of DACs (that are PCM DAC and high end DSD DAC), are used on AV board.
The audio data path to both DACs is routed via the Furore 2.

I^2S *audio*

The STi55xx is capable of 6-channel I^2S output. These channels can be configured to output 5.1 Dolby Digital, DTS, etc.

- PCM_OUT0: Left and Right.
- PCM_OUT1: Centre and LFE (subwoofer).
- PCM_OUT2: Left and Right surround.

Two additional channels (available in STi5580 and STi5588) are capable of providing down-mixed stereo.

S/PDIF

The S/PDIF signal level (pin 57, SPDIF_OUT) is 5V TTL at module interface. To meet the complete S/PDIF specifications, an external de-coupling circuit (item 7720, diagram M7) is implemented.

I^2S *karaoke (optional)*

The STi5580 and STi5588 have built-in karaoke processing. The internal karaoke block accepts I^2S signal, acting as the master by generating the required KOKPCMCLK frequency. This frequency is always 1/4 the music sampling frequency. An external analogue-to-digital converter (ADC), acting as slave, is required to convert the microphone signals to I^2S signals.

CD-DA/DVD Data Path

The data path for CD-DA and DVD is as follows:

- I^2S data from the M2 basic engine enters the STi55xx.
- The STi55xx processes the data, and sends the 6 PCM output channels to Furore 2. The LeRi channels are directly passed to the AV board also.
- The switch matrix of the Furore 2 sends the two incoming stereo PCM channels (LeRi) to the AV board.
- The switch matrix of the Furore 2 sends the six incoming PCM channels to the high end DAC board.
- The mute signal from the STti55xx is directly passed to the AV board. This requires a patch on the mono board.
- The IEC958 output of the STi55xx is fed directly to AV board.

The clock distribution is as follows:

- The master clock 384FS is received from the high end DAC board.
- From this clock the 27 MHz clock for STi5580 and the Furore 2 is derived (Video clock).
- From the 27 MHz clock the audio clock (256FS) is derived. The STi55xx and Furore 2 use this clock. For CD-DA FS amounts to 44.1 kHz, for DVD 48 or 96 kHz.
- In case of CD-DA, the high end DAC uses its internal clock (384FS). In case of DVD, the switch matrix of Furore 2 sends the audio clock (256FS) to the high end DAC on AV board.
- The AV board receives the 256FS clock.

Selection of the audio clock is done in the clock factory. For a description of the clock factory, see paragraph 'Clock Factory'.

SACD Data Path

The data path for DSD/DST is as follows:

- I^2S data from the basic engine enters the Furore 2.
- The Furore 2 processes the data. This results in 6 DSD/DST channels.
- The switch matrix of the Furore 2 sends the 6 DSD/DST channels to the high end DAC on AV board.
- The 6 DSD/DST channels are down mixed to a stereo PCM signal.
- The switch matrix of the Furore 2 sends the stereo PCM signal to the AV board.
- The mute signal from the STi55xx is directly passed to the AV board. This requires a patch on the mono board.

The clock distribution is as follows:

- The master clock 384FS is received from the high end DAC on AV board.
- From this clock the 27 MHz clock for Sti55xx and Furore 2 is derived (video clock).
- From the 27 MHz clock the audio clock (256FS) is derived. The STti5580 and Furore 2 use this clock.
- The high end DAC on AV board uses its own XTAL clock (384FS). The 256FS clock to the DAC board is switched off, to prevent for interference.
- The AV board receives the 256FS clock.

Selection of the audio clock is done in the clock factory. For a description of the clock factory, see paragraph 'Clock Factory'.

Video Output

Digital video (optional)

Digital YUV output is routed directly from STi55xx ports to a 24-pin connector (item 1704). From the same connector, the HSYNC, VSYNC and 27MHZ_CLK signals are available. The digital YUV connector is the interface to external video processing devices; such as high quality progressive scan codex and high quality video DAC.

Analogue video

The STi55xx is capable of 6-channel analogue video. Three channels (pins 25, 26 and 27) are RGB or YUV format, while the other three channels (pins 32, 33 and 34) are Y, C, and CVBS.
A video output buffer (see diagram M7, e.g. item 7701 for R) is implemented: an 8MHz/16MHz selectable filter stage and a 75Ω drive stage.

Clock Factory

One clock factory is implemented to support all clocks required by the Furore 2. The various master clock, which depends on whether SACD is present, is used for SD4.00_SA_CH. The clock factory of SD4.00_SA_CH is showed in Figure 8-2.

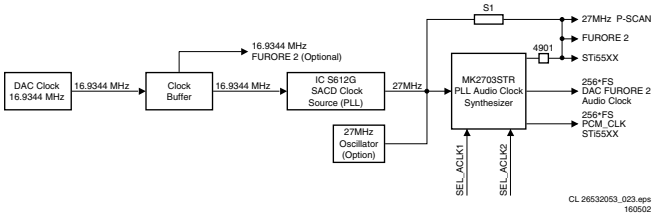


Figure 9-7 Block diagram clock factory

For the SACD player, the clock system is a DAC master clock system. For non-SACD player, the clock system is a mono board master clock system.
The Furore 2 supports clock 256*FS/384*FS/512*FS. The most convenient value in the market is 16.9344 MHz (384*FS, FS=44.1kHz). Therefore, the master clock on the SD4.00_SA_CH mono board is the 384*FS coming from the A/V board. The 384*FS (16.9344 MHz) from the DAC clock, must always be present. It is buffered before it is sent to the Furore 2 and the rest of the clock factory. The IC S612G delivers a 27 MHz system clock.
The Furore 2 and Sti5580/Sti5588 (Video) use this clock. It is used to derive the PCM audio clocks 256*FS by the MK2703STR. This IC is also used to buffer the incoming 27 MHz clock.
The communication between the Sti55xx and the Furore 2 is asynchronous.
To support non-SACD playback, an on-board 27MHz oscillator delivers the master clock for SD4.00_SA_CH mono board.

Miscellaneous

Most general IO ports are connected directly to the module interface. Compared with the SD3.0 module, some on-board circuits are removed, as it made more sense (and more cost effective) to implement these circuits externally.

SCART Status Signal

The SCART0 and SCART1 signals are directly available at the module interface, where the 0_6_12V signal is generated. See table below:

Table 9-1 0_6_12V SCART status truth table

Function	PIO3_6 (SCART0)	PIO3_7 (SCART1)	0_6_12V (at SCART connector)
TV display	1	1	0V
TV display	0	1	0V
16:9 aspect ratio	1	0	+6V
4:3 aspect ratio	0	0	+12V

Mute

The audio MUTE signal (active 'high') is directly available at the module interface.

Service

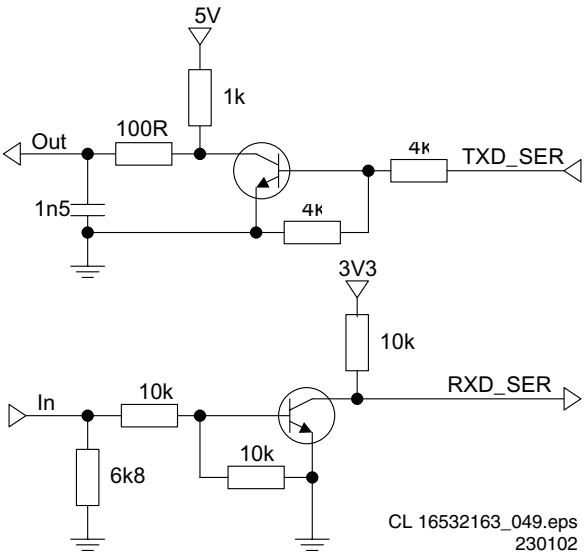


Figure 9-8 Service Port Buffer

The service port (see diagram M5) is simplified to reduce cost. The unused RTS and CTS lines are no longer connected. A transistor buffer (item 7502) is used instead of the Schmitt Trigger buffer (item 7501).
The overall loading and driving capability of the RS-232 emulator port is not greatly changed. However, as a precaution, the Schmitt Trigger circuit remains in the layout as an optional implementation.

This SD4.0SA_CH has the same ComPair connector as in previous DVD generations. Flashing of the application-SW is not possible with the ComPair cable, except with a CD-R disc. For sets with Mask-ROM software, replace it with a programmed Flash (available via your Philips Service organisation).

Power Supply (diagram M7)

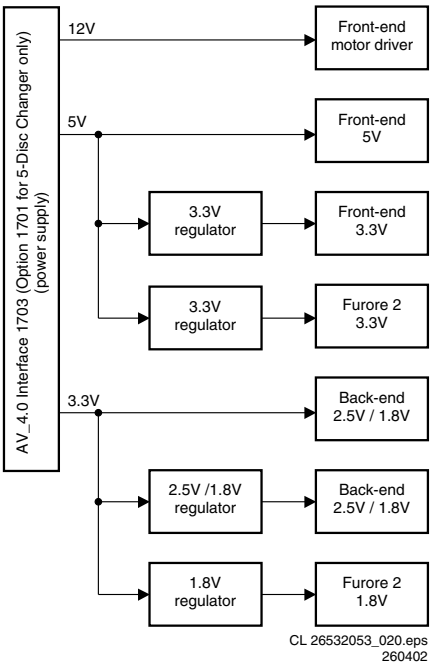


Figure 9-9 Mono Board Power Supply Block Diagram

The main power supplies to the module are 3.3V, 5V, and 12V (input via connector 1703).

The SACD DSD/DST decoder Furore 2 uses 1.8V for its core and analogue portion, and 3.3V for its interface. The on-board 1.8V linear regulator LF18ABDT and 3.3V linear LD1117DT33 are used to generate 1.8V and 3.3V power supply respectively. The back-end section mainly uses the 1.8V or 2.5V and 3.3V, which depend on which back-end processor is used. The on-board linear regulators LF25ABDT or LF18ABDT are used to generate the 2.5V (or 1.8V) required by the STi55xx.
The front-end section mainly uses the 5V and 12V. An on-board linear regulator LD1117DT33 can be used to generate the 3.3V required by the front-end. The 12V is used by the motor and servo drivers.

Reset Circuit

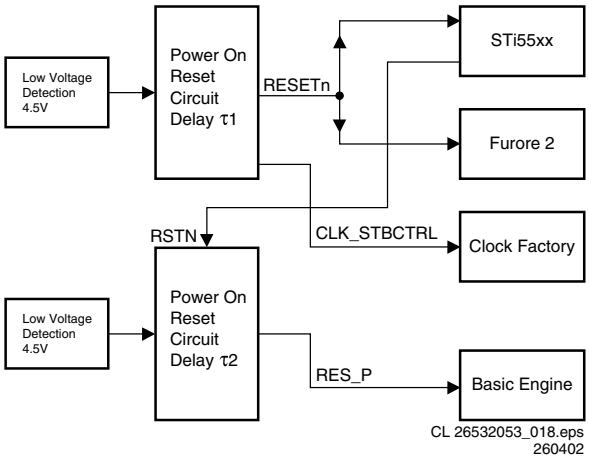


Figure 9-10 Block diagram of reset circuit

This reset circuit takes care that booting the different devices on the mono board takes place in the correct order. The correct reset order is:

1. The Power On Reset circuit (delay t1) creates a reset signal 'RESETn' to reset the STi55xx and Furore .
2. In the meantime, the Power On Reset circuit (delay t1) creates a reset signal 'CLK_STBCTRL', which is inverted to 'RESETn', to enable the Clock Factory.
3. Then, the Power On Reset circuit (delay t2) generates a reset signal 'RES_P' to reset the Basic Engine.
4. The STI55xx can now reset the Basic Engine via 'RSTN'.

9.4 Audio/Video (A/V) Board

This board is the interface panel between the DVD-player and its peripherals.

9.4.1 Block diagram

See Block diagram A/V Board in chapter 6.

9.4.2 Control

The control of the A/V board is done by I^2C-decoder IC7107 (see table below):

Table 9-2 Control lines overview IC7107

Description	Pin	Hi	Lo
CLK_SEL	12	External clock (DSD stream)	Internal clock (PCM stream)
UPSAMPLING	11	No upsampling	Upsampling
DAC_RESET	10	Normal	Reset
CENTER_ON	9	Off	On
SPDIF-MUTE	5	Mute	No mute
192k/96k	4	192k PCM	96k PCM

9.4.3 Video

The analogue video signals from the Mono Board are buffered before they are fed to the A/V board. The video outputs from the A/V Board are RGB/YUV, YC, and CVBS. These signals are also fed to the double SCART board.

9.4.4 Audio

The digital audio signals for Surround, Centre and LFE (subwoofer) are fed to a 6-channel DAC CS4362 (item 7300, 48-pin LQFP) for the audio output. This DAC accepts both DSD and PCM data streams.

The digital audio signals for Front and Stereo are fed to a high performance current output DAC AD1955 (item 7301) via a multiplexer (item 7200) which selects either the direct PCM or an upsampled data stream (determined by the UPSAMPLING control line.
The Upsampling is only applicable for CD playback, and the AD1895 sample rate converter (item 7201) converts the 44.1 kHz/16 bit audio to various formats such as 96 kHz/24 bit or 192 kHz/24 bit.
The bit and word clock, required by the upsampling DAC AD1955 (item 7301), are derived from the 24.576 MHz master clock (item7103) via counter (item 7204/7205).

The S/PDIF, only supports digital output upsampling of 96 kHz/24 bit and is encoded by the digital audio transmitter AK4103 (item7203).

There is a control line from IC7107, called CENTRE_ON, which is used to switch between the centre channel and front channels for both SACD- and DVD modes.

9.5 Progressive Scan Board

The DVD963SA series offer progressive scan YUV outputs, and the option to select the interlace YUV output by a sliding switch on the board (selectable at the rear of the player).

9.5.1 Block diagram

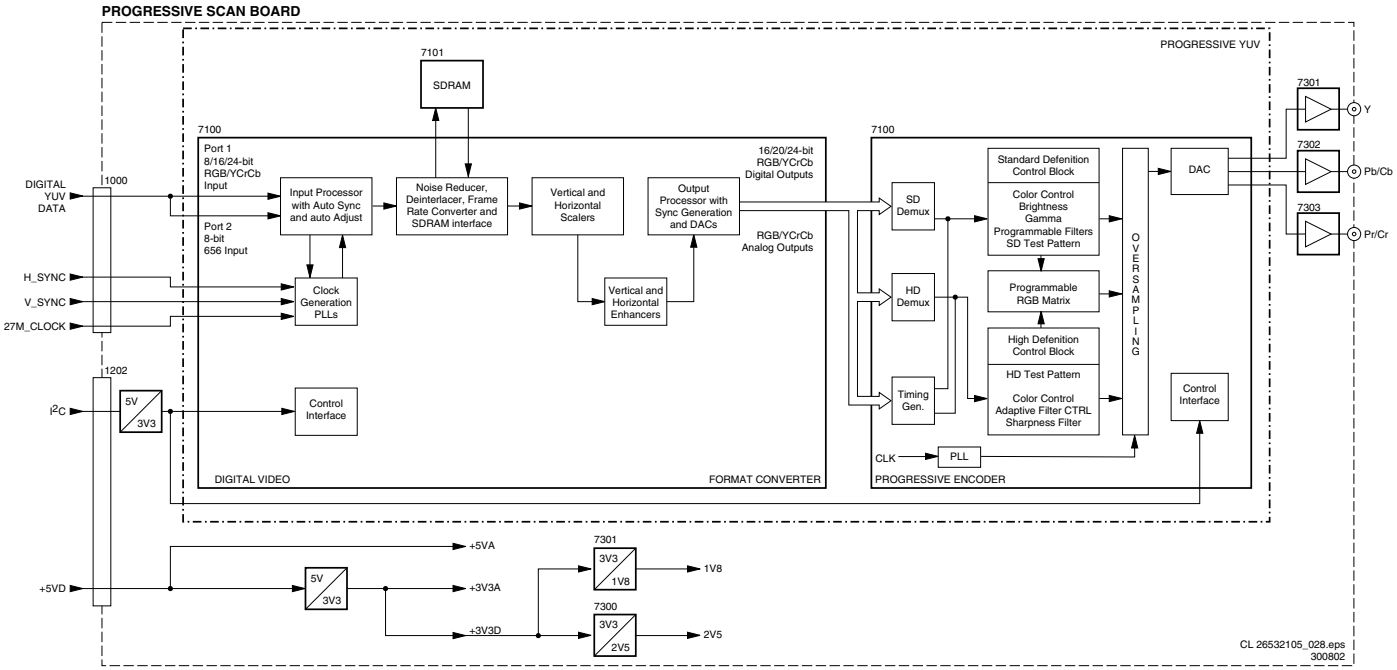


Figure 9-11 Block diagram Progressive Scan Board

9.5.2 Progressive YUV

This creates a picture signal with double the scan lines of a conventional interlaced picture, to create a noticeably sharper and smoother image. It offers higher picture resolution and eliminates virtually all motion artefacts. Even on large screens, the progressive scan lines are barely noticeable and it reduces picture flickering significant.

Two new IC's are used: the Faroudja FLI2310 Digital Video Format Converter, and the Analog Devices ADV7300 Progressive Scan Video Encoder.

This board also offers the Digital Crystal Clear feature, which allow you to fine-tune the following parameters:

- Gamma correction.
- Chroma and Luma delay.
- Sharpness.
- DCDi: to produce a smooth and natural looking image without visible artifacts (like jagged edges).
- True life: brings out details in the picture, producing a more life-like image.

9.6 Double SCART

This board consists of two SCART connectors and a SCART-switch (item 7501, STV6410), which is controlled by I²C. In a P50 player with double SCART connectors, video and audio loop-through must be available. This loop-through is controlled by the P50 commands, which are send via pin 10 of the SCART connector. When the DVD player is in standby, the loop-through is active. During standby, the display (slave) processor is active (takes over the I²C-bus), and will manage the P50 commands.

Note: The loop-through only functions when the DVD-player is in standby (NOT in low power standby)

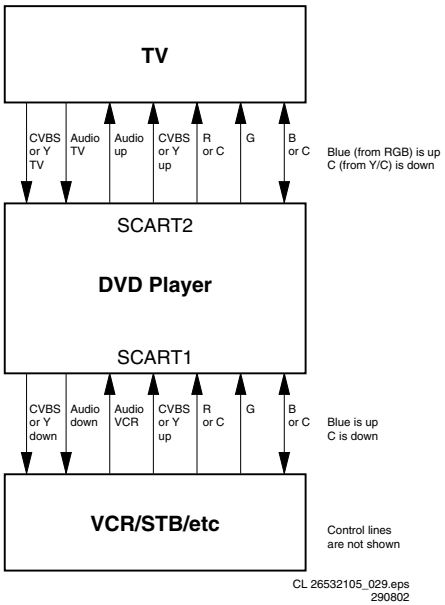


Figure 9-12 Loop-through set-up

The B component (from RGB) and the C component (from Y/C) share the same pin on the SCART connector (pin 7). Because the B-signal is an "up-stream" signal (towards the TV) and the C-signal is a "down-stream" signal (towards the VCR), this pin 7 must be a bi-directional pin. Because the STV6410

does not support this, an external circuit (two bi-directional switches, named switch "1" and switch "2") is added. The Y- and CVBS-components also share the same pins.

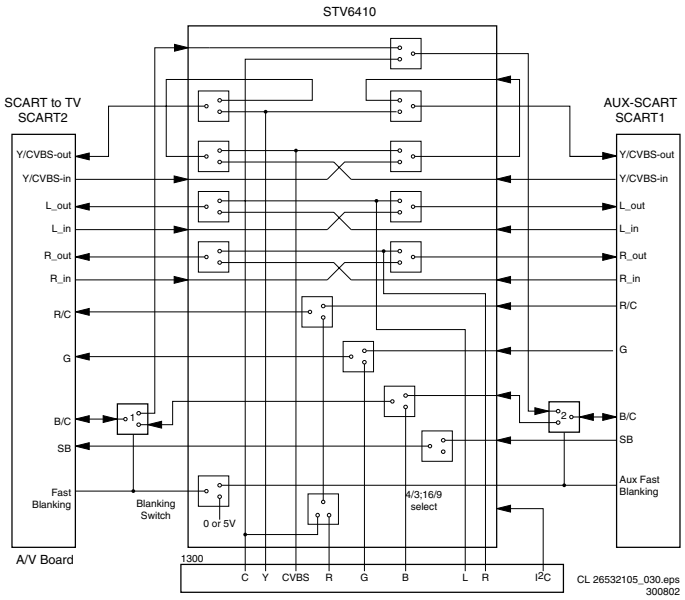


Figure 9-13 SCART switching circuitry

- Switch "1" is controlled by the FB (Fast Blanking) pin (pin 16) of SCART2 (TV SCART):
  – If the FB line is low, C is input on the B/C of SCART2.
  – If the FB line is high, B is output on the B/C of SCART2.
- Switch "2" is controlled by the FB (Fast Blanking) pin (pin 16) of SCART1 (AUX SCART):
  – If the FB line is low, C is output on the B/C of SCART1.
  – If the FB line is high, B is intput on the B/C of SCART1.

We can distinguish four situations:
1. DVD player is ON, DVD is active (DVD mode): NO LOOP-TROUGH.
2. DVD player is ON, DVD is not active (TV mode): LOOP-TROUGH.
3. DVD player is ON, external source becomes active: LOOP-TROUGH.
4. DVD player is in STBY: LOOP-TROUGH.

9.7 Control and Display Panel

9.7.1 Control

Slave processor
The key component on this board is the (slave) microprocessor (item 7401). It runs on an 8 MHz system clock generated with a ceramic resonator (item 1119) and has a reset circuit (item 7105) that is triggered by the +5Vstb voltage.
The start-up sequence is as follows:
1. The required IC voltage is the +5Vstb, which is present during Standby Mode.
2. When the RESET circuit (item 7105) is triggered by the +5Vstb, the slave uP initialises.
3. This will set the STDBY_CONTROL signal to LOW, which will switch on the 12V and subsequently the +3V3.
4. Once these voltages are provided, the host uP (on the mono board) will reset (via reset circuit around item 7412 on the mono board, diagram M4).
5. Now, the host uP will initialise, and indicate the slave uP to activate the Standby Mode (STBY_CONTROL) signal.
6. The player wakes up from the Standby Mode when any button is pressed on the front panel, or when the 'Power' button is pressed on the Remote Control.

Also, when going to Standby, the slave processor will reset the host processor. When the slave processor receives the correct IR (or key) code to leave the Standby mode, it resets the host processor.

Note: The slave uP will not reset successfully, if the 8MHz clock oscillator has not stabilised (check on pin 8 of IC7101).

Other slave processor functions are:
- Generation of a scanning grid for the keys,
- Generation of the display grid and segment scanning,
- Generation of square signal to generate the filament voltage for FTD display,
- Inputs for RC5/6 and P50 (P50 controller is build in).

Standby LED
Transistor 7104 drives the Standby LED. When the STBLED signal from the slave processor is ‘high’ (pin 14), the LED is ‘off’.

Key Matrix
When a key on the local keyboard is pressed, the signal at the scanning pins of the microprocessor (pins 34, 35, 36 and 37) go from +5 V to 0 V.

IR Receiver
The IR controller in the slave processor handles both RC5 and RC6 signals (input on pin 22). The logic is +5 V for ‘high’ and 0 V for ‘low’.

Status LEDs
The four status LEDs (SOUND, AUDIO DIRECT, UP-SAMPLING, and P-SCAN) are controlled by the slave processor.

P50 Interface
P50 (or Easylink) is a bi-directional serial interface for communication between video equipment. For European sets, this communication goes via pin 10 of the SCART connector, while for other regions (when present), this is a cinch connector. The slave processor controls the P50 bus (via pins 11 and 20).

9.7.2 Display

Because these DVD players have an AC display (FTD) and a DC supply, an AC voltage is created by the microprocessor The slave processor has an internal square signal generator (42 kHz, duty cycle 45/55), to generate the AC filament voltage. This square voltage is amplified (by TS7106 and 7109) and decoupled (C2138 and C2143) before it is applied to the display. The necessary voltage of -32 V comes directly from the PSU.

9.8 Abbreviation list

ADC	Analogue to Digital Converter
AGC	Automatic Gain Control
ASD	Architecture and Standard Design
AM	Amplitude Modulation
BE	Basic Engine
ComPair	Computer aided rePair
CD-DA	CD Digital Audio
CS	Chip Select
CVBS	Composite Video Blanking and Synchronisation
DAC	Digital to Analogue Converter
DAIO	Digital Audio Input Output
DEMUX	De-multiplexer
DENC	Digital Encoder
DFU	Direction For Use: description for the end user
DNR	Dynamic Noise Reduction
DRAM	Dynamic Random Access Memory
DSD	Direct Stream Digital
DSP	Digital Signal Processing
DST	Direct Stream Transfer (= loss less compressed DSD signal)
DTS	Digital Theatre Sound
DVD	Digital Versatile Disc
EEPROM	Electrically Erasable and Programmable Read Only Memory
EFM	Eight to Fourteen bit Modulation
EMI	External Memory Interface (STi55xx)
FFC	Flat Foil Cable
FLASH	Flash memory
HPF	High Pass Filter
HW	Hardware
I^2C	Integrated IC bus (signals at 5V level)
I^2S	Integrated IC Sound bus (signals at 3.3V level)
IC	Integrated Circuit
IF	Intermediate Frequency
IRQ	Interrupt Request
KOK	Karaoke
LFE	Low Frequency Effect (= subwoofer)
LLD	Loss Less Decoder
LPCM	Linear Pulse Code Modulation
LRCLK	Left/Right clock
LVTTL	Low Voltage Transistor Transistor Logic (3.3V logic)
M2	Mercury 2 Basic Engine
MACE	Mini All Compact Disc Engine
MPEG	Motion Pictures Experts Group
NC	Not Connected
NVM	Non Volatile Memory (= IC containing TV related data e.g. alignments)
OC	Open Circuit
OPU	Optical Pick-up Unit
PCB	Printed Circuit Board (see PWB)
PCM	Pulse Code Modulation
PCM_CLK	Audio system clock for DAC
PCM_OUTx	Audio serial output data
PSP	Pit Signal Processing
PSU	Power Supply Unit
PWB	Printed Wiring Board (see PCB)
RAM	Random Access Memory
RGB	Red, Green and Blue colour space
ROM	Read Only Memory
S2B	Serial to Basic Engine (= communication bus between host- and servo processor)
SCL	Serial Clock I^2C
SCLK	Audio serial bit clock
SDA	Serial Data ^{I2C}
SDRAM	Synchronous DRAM
SMI	Shared Memory Interface
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
STBY	Standby
SVCD	Super Video CD
SW	Software
THD	Total Harmonic Distortion
TTL	Transistor Transistor Logic (5V logic)
uP	Microprocessor
VAL	Video Audio Loader
VCD	Video CD
Y/C	Luminance (Y) and Chrominance (C) signal
YUV	Component video

9.9 IC Data

In this paragraph, the internal block diagrams and pinning are given of ICs that are drawn as 'black box' in the electrical diagrams (with the exception of 'memory' and 'logic' ICs).

9.9.1 Diagram Power Supply: TY72011P2 (item 7130

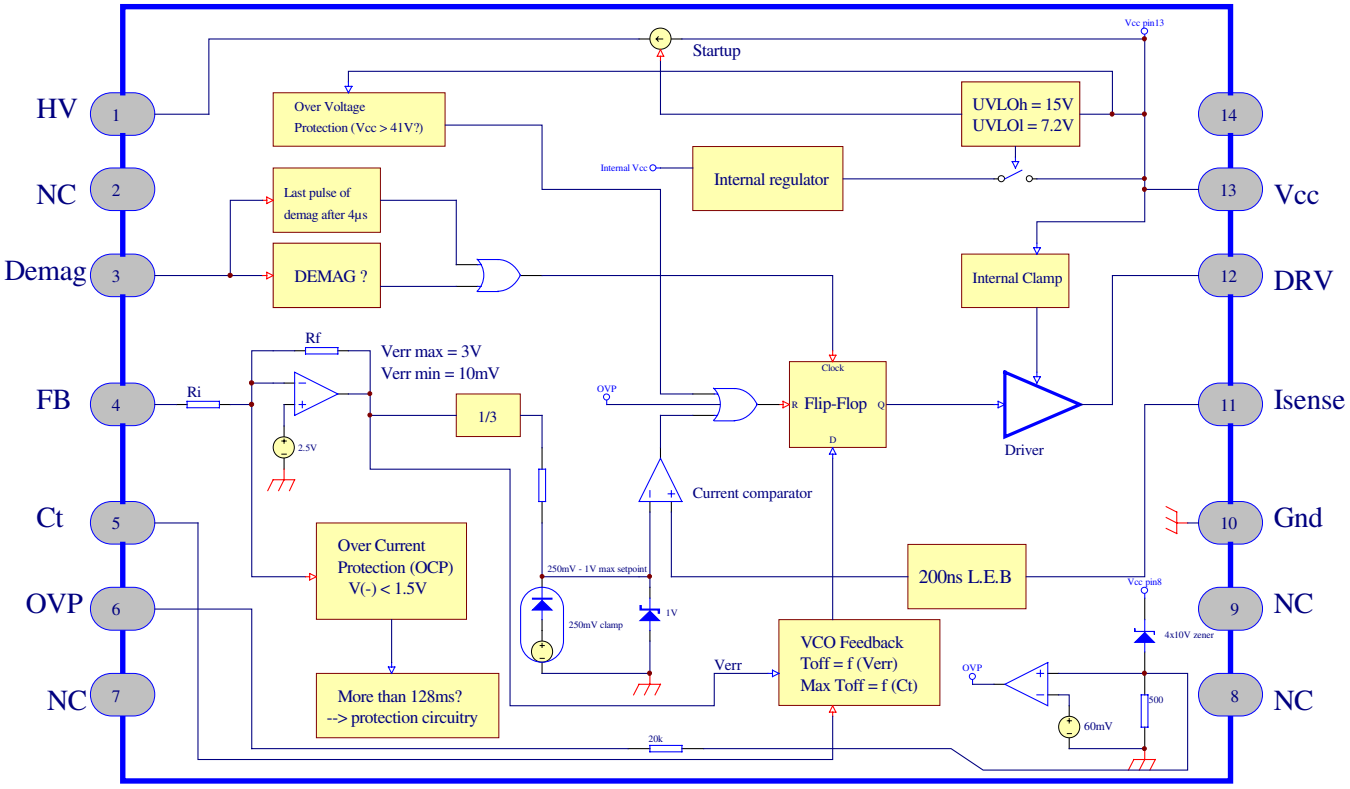


Figure 9-14 Block Diagram

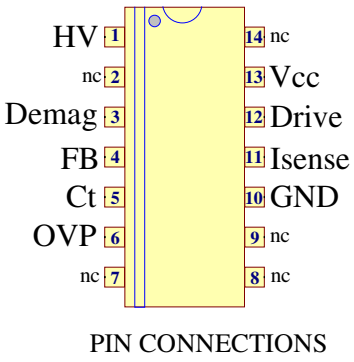
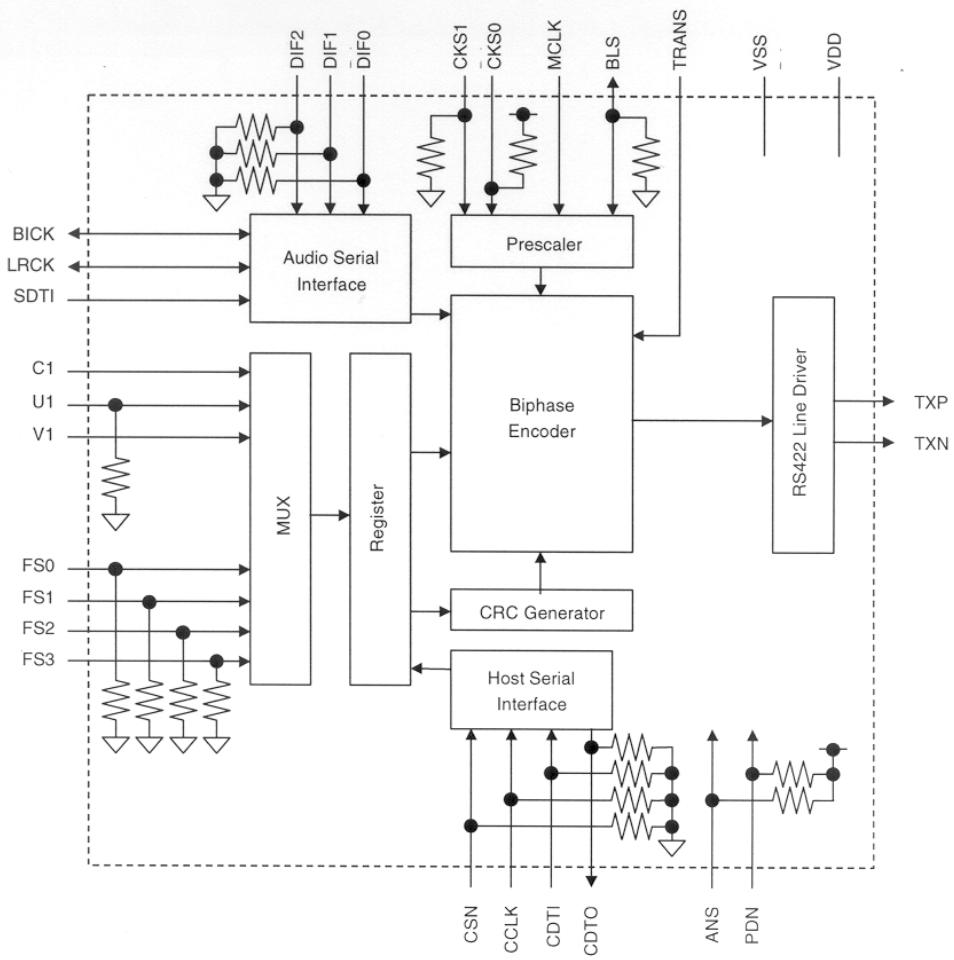


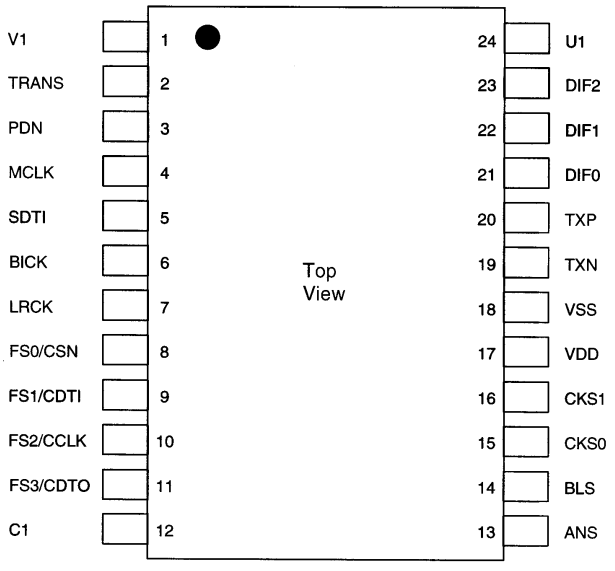
Figure 9-15 Pinning

9.9.2 Diagram A2: AK4103VF (IC7203)

■ Block Diagram



■ Pin Layout



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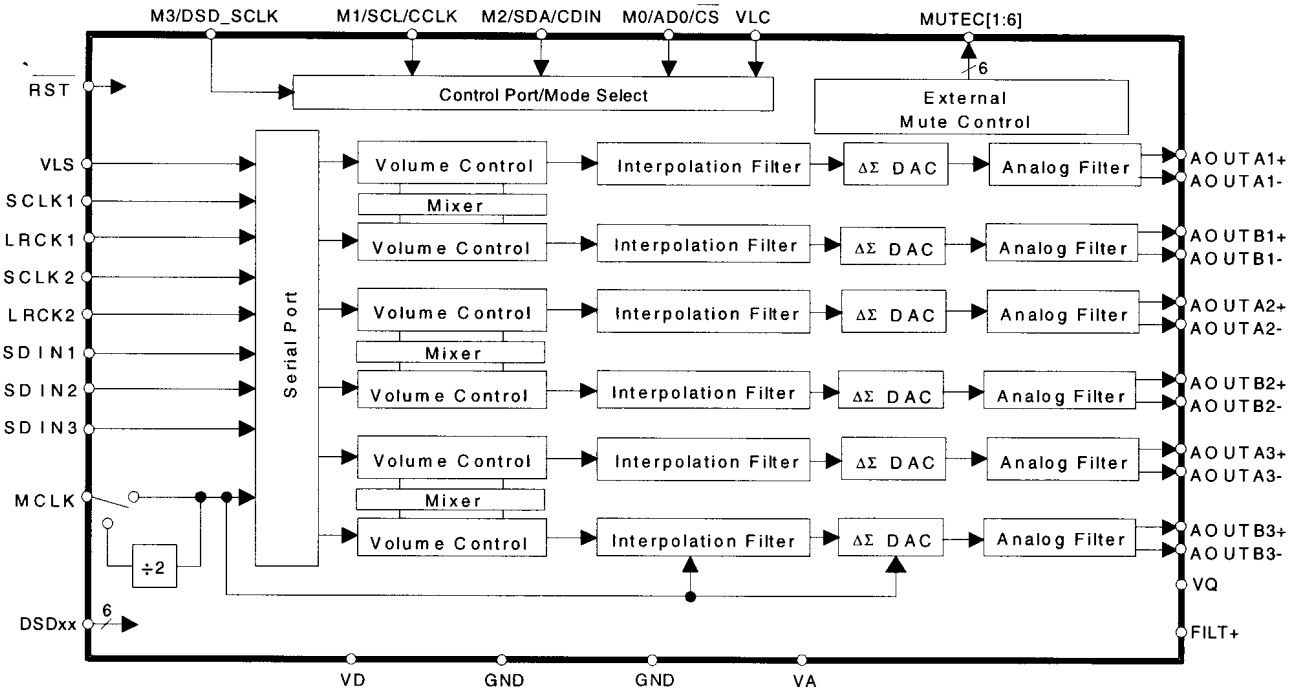
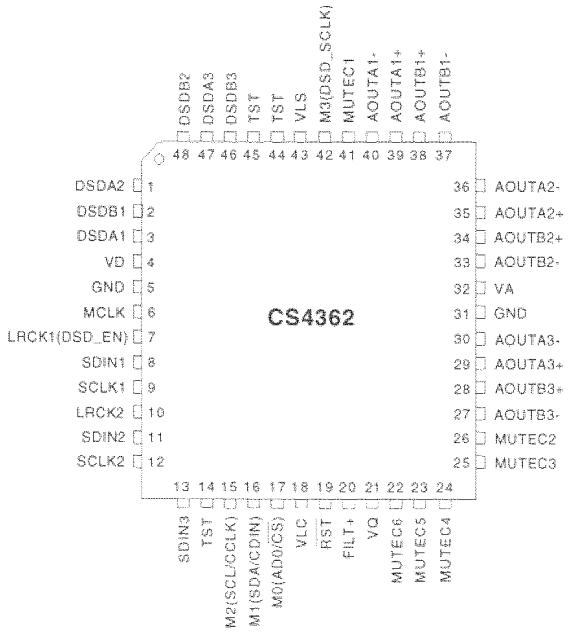
300802

Figure 9-16 AK4103VF (IC7203)

9.9.3 Diagram A3: CS4362 (IC7300)





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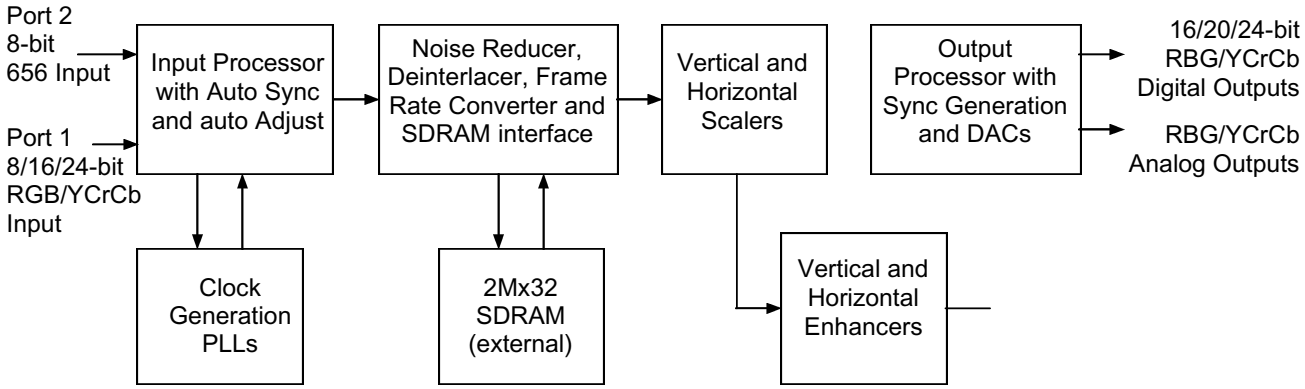
300802

Figure 9-17 CS4362 (IC7300)

9.9.4 Diagram P1: FLI2301 (item 7100)

BLOCK DIAGRAM

Simplified Internal Block Diagram



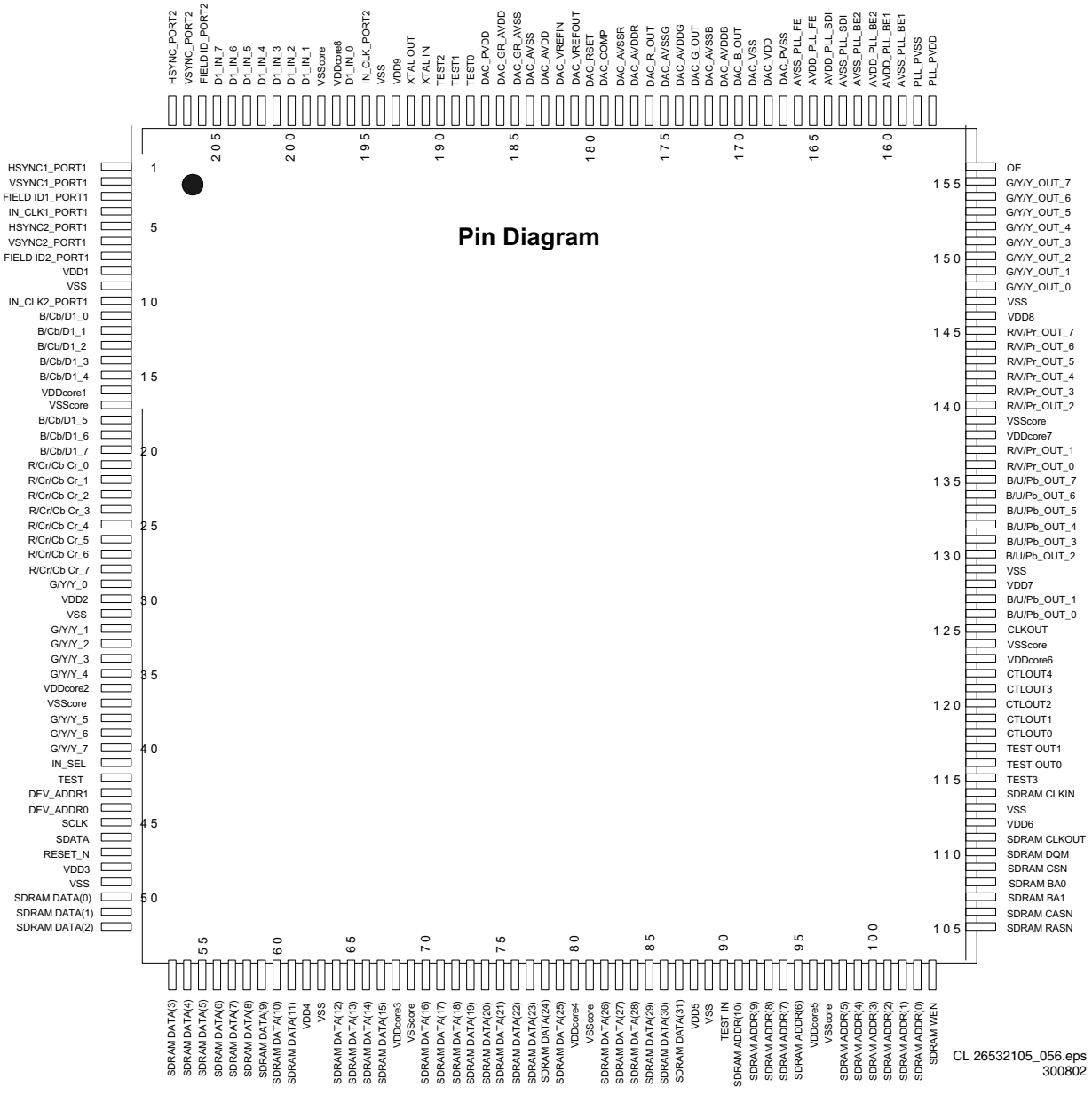


Figure 9-18 FLI2301 (item 7100)

10. Spare Parts List

Mechanical /001

Various

0002	3139 247 56601	FRONT ASSY DVD963SA/00X
0078	3139 243 10161	FILTER FTD SACD900
0150	3139 247 56581	BOTTOM FRAME ASSY DVD963SA/00X
0155	2422 030 00395	SOC POW H 3P M AC IEC B
0250	3139 247 56571	PLATE BACK DVD963SA/00X PPT
0300	3139 247 51691	COVER TOP DVD956K PNT PRT
0350	3139 238 02121	PROD. ASSY RC19237006/01H PKD
0360▲	2422 070 98224	MAINSCORD IEC 10A 1M5 DET BK B
0365	3103 308 92610	CABLE AUDIO 2X2RCA MALE 1.5MTR
0366	4822 321 61579	VIDEO-CABLE
0372	2422 076 00468	CBLE SCART 1M1 SCART 21P BK B
0375	3139 246 11991	IFU DVD963SA/00X
1010▲	3122 427 23261	PSU SUPER AUDIO CD WR HE
1103	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP
1104	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP
1108	3139 241 00191	FFC FOIL 24P/180/24P BD1MMP FD
1110	3139 241 00201	FFC FOIL 22P/220/22P BD 1MMP
0374	3139 246 12131	IFU2 DVD963SA/00X

Mechanical /171

Various

0002	3139 247 56601	FRONT ASSY DVD963SA/00X
0078	3139 243 10161	FILTER FTD SACD900
0150	3139 247 56581	BOTTOM FRAME ASSY DVD963SA/00X
0155	2422 030 00395	SOC POW H 3P M AC IEC B
0250	3139 247 56561	PLATE BACK DVD963SA/17X PPT
0300	3139 247 51691	COVER TOP DVD956K PNT PRT
0350	3139 238 02121	PROD. ASSY RC19237006/01H PKD
0360▲	2422 070 98223	MAINSCORDUL 10A 1M5 DET BK B
0365	3103 308 92610	CABLE AUDIO 2X2RCA MALE 1.5MTR
0366	4822 321 61579	VIDEO-CABLE
0375	3139 246 11961	IFU DVD963SA/17X
1010▲	3122 427 23471	PSU SUPER AUDIO CD USA 35PS104
1103	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP
1104	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP
1108	3139 241 00191	FFC FOIL 24P/180/24P BD1MMP FD

Mechanical /691

Various

0002	3139 247 56601	FRONT ASSY DVD963SA/00X
0078	3139 243 10161	FILTER FTD SACD900
0150	3139 247 56581	BOTTOM FRAME ASSY DVD963SA/00X
0155	2422 030 00395	SOC POW H 3P M AC IEC B
0250	3139 247 56561	PLATE BACK DVD963SA/17X PPT
0300	3139 247 51691	COVER TOP DVD956K PNT PRT
0350	3139 238 02121	PROD. ASSY RC19237006/01H PKD
0360▲	2422 070 98224	MAINSCORD IEC 10A 1M5 DET BK B
0365	3103 308 92610	CABLE AUDIO 2X2RCA MALE 1.5MTR
0366	4822 321 61579	VIDEO-CABLE
0375	3139 246 11951	IFU DVD963SA/69X
1010▲	3122 427 23261	PSU SUPER AUDIO CD WR HE
1103	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP
1104	3139 110 36071	FFC FOIL 30P/100/30P BD 1MMP
1108	3139 241 00191	FFC FOIL 24P/180/24P BD1MMP FD

SD4.00SA Module

Various

0001	9305 023 61114	VAL6011/14

AV PWB

Various

1101	2422 543 01255	RES XTL SM 24MHz 576 30P AT-51R
1102	2422 543 01297	RES XTL SM 33M8688 16P NX6035R
1400	2422 025 17433	CON BM V 30P F 1.00 FFC 0.3 B
1401	2422 026 05345	SOC CINCH H 4P F YEWHYERD Y
1402	2422 026 05088	CON BM CINCH H 6P F B
1403	4822 265 11154	52030-2210 (22P)
1408	2422 026 05188	CON BM MDIN H 3P F TCS7927 B
1410	4822 267 31626	
1420	2422 025 10772	CON BM V 12P M 2.00 PH B
1421	2422 025 17433	CON BM V 30P F 1.00 FFC 0.3 B
1422	2422 025 17467	CON BM V 8P M 2.50 MIS B

⊣⊢

2100	2238 586 59812	0603 50V 100NP80M
2101	4822 122 33761	22pF 5% 50V
2102	4822 126 11785	0603 50V 47P 5%
2103	4822 122 33752	15pF 5% 50V
2104	4822 122 33752	15pF 5% 50V
2105	4822 126 11663	12pF
2106	4822 126 11663	12pF
2107	4822 122 33752	15pF 5% 50V
2108	2238 586 59812	0603 50V 100NP80M
2110	2238 586 59812	0603 50V 100NP80M
2111	2238 586 59812	0603 50V 100NP80M
2112	2238 586 59812	0603 50V 100NP80M
2113	2238 586 59812	0603 50V 100NP80M
2114	2020 552 93645	0603 50V 39P 5%
2115	2020 552 93645	0603 50V 39P 5%
2116	4822 122 33761	22pF 5% 50V
2117	2238 586 59812	0603 50V 100NP80M
2118	4822 126 11663	12pF
2119	4822 126 11663	12pF
2200	2238 586 59812	0603 50V 100NP80M
2201	2238 586 59812	0603 50V 100NP80M
2202	2238 586 59812	0603 50V 100NP80M
2203	2238 586 59812	0603 50V 100NP80M
2204	2238 586 59812	0603 50V 100NP80M
2205	4822 124 40248	10µF 20% 63V
2206	4822 124 40248	10µF 20% 63V
2207	2238 586 59812	0603 50V 100NP80M
2208	2238 586 59812	0603 50V 100NP80M
2209	2238 586 59812	0603 50V 100NP80M
2210	4822 124 40248	10µF 20% 63V
2211	2238 586 59812	0603 50V 100NP80M
2212	4822 124 40248	10µF 20% 63V
2213	4822 124 40248	10µF 20% 63V
2300	2238 586 59812	0603 50V 100NP80M
2301	4822 124 40248	10µF 20% 63V
2302	4822 124 21913	1µF 20% 63V
2303	2238 586 59812	0603 50V 100NP80M
2304	2238 586 59812	0603 50V 100NP80M
2305	4822 124 21913	1µF 20% 63V
2306	2238 586 59812	0603 50V 100NP80M
2307	4822 124 40433	47µF 20% 25V
2308	2238 586 59812	0603 50V 100NP80M
2309	4822 124 21913	1µF 20% 63V
2310	2238 586 59812	0603 50V 100NP80M
2311	4822 124 41584	100µF 20% 10V
2312	4822 124 41584	100µF 20% 10V
2313	2238 586 59812	0603 50V 100NP80M
2314	4822 124 40433	47µF 20% 25V
2315	2238 586 59812	0603 50V 100NP80M
2316	2238 586 59812	0603 50V 100NP80M
2317	4822 124 40248	10µF 20% 63V
2318	2238 586 59812	0603 50V 100NP80M
2319	4822 124 21913	1µF 20% 63V
2321	2020 552 94427	0603 50V 100P 5%
2323	2020 552 94427	0603 50V 100P 5%
2400	2238 586 59812	0603 50V 100NP80M
2401	2238 586 59812	0603 50V 100NP80M
2402	2238 586 59812	0603 50V 100NP80M
2403	2238 586 59812	0603 50V 100NP80M
2404	2238 586 59812	0603 50V 100NP80M
2405	2238 586 59812	0603 50V 100NP80M
2406	2238 586 59812	0603 50V 100NP80M
2407	2238 586 59812	0603 50V 100NP80M
2408	2238 586 59812	0603 50V 100NP80M
2409	2238 586 59812	0603 50V 100NP80M
2410	2238 586 59812	0603 50V 100NP80M
2411	2238 586 59812	0603 50V 100NP80M
2412	4822 124 40207	100µF 20% 25V
2413	4822 124 40207	100µF 20% 25V
2414	2020 552 94427	0603 50V 100P 5%
2415	2020 552 94427	0603 50V 100P 5%
2416	2020 552 94427	0603 50V 100P 5%
2417	3198 016 36810	0603 25V 680P COL R
2418	4822 126 13881	470pF 5% 50V
2419	3198 016 36810	0603 25V 680P COL R
2420	4822 126 13881	470pF 5% 50V
2421	2020 012 93792	EL FG 16V S 100µF PM20 A
2422	2020 552 94427	0603 50V 100P 5%
2423	2020 552 94427	0603 50V 100P 5%
2424	2020 552 94427	0603 50V 100P 5%
2425	3198 016 36810	0603 25V 680P COL R
2426	4822 126 13881	470pF 5% 50V
2427	3198 016 36810	0603 25V 680P COL R
2428	4822 126 13881	470pF 5% 50V
2429	2020 012 93792	EL FG 16V S 100µF PM20 A
2431	3198 016 31020	0603 25V 1nF
2432	3198 016 31020	0603 25V 1nF
2434	3198 016 31020	0603 25V 1nF
2436	3198 016 31020	0603 25V 1nF
2437	3198 016 31020	0603 25V 1nF
2439	3198 016 31020	0603 25V 1nF
2440	3198 016 31020	0603 25V 1nF
2441	3198 016 31020	0603 25V 1nF
2442	4822 124 80195	470µF 20% 10V
2443	4822 124 80195	470µF 20% 10V
2444	4822 124 80195	470µF 20% 10V
2445	4822 124 80195	470µF 20% 10V
2500	2238 586 59812	0603 50V 100NP80M
2501	2238 586 59812	0603 50V 100NP80M
2502	2238 586 59812	0603 50V 100NP80M
2503	2238 586 59812	0603 50V 100NP80M
2510	4822 126 14506	270pF 5% 50V 0603
2511	4822 126 13881	470pF 5% 50V
2512	2020 552 94427	0603 50V 100P 5%
2513	2020 552 94427	0603 50V 100P 5%
2514	4822 126 13881	470pF 5% 50V
2515	4822 126 14506	270pF 5% 50V 0603
2516	4822 126 14506	270pF 5% 50V 0603
2517	2020 552 94427	0603 50V 100P 5%
2518	4822 126 13881	470pF 5% 50V
2519	4822 126 14506	270pF 5% 50V 0603
2520	2020 552 94427	0603 50V 100P 5%
2521	4822 126 13881	470pF 5% 50V
2522	4822 126 14506	270pF 5% 50V 0603
2523	4822 126 13881	470pF 5% 50V
2524	2020 552 94427	0603 50V 100P 5%
2525	2020 552 94427	0603 50V 100P 5%
2526	4822 126 13881	470pF 5% 50V
2527	4822 126 14506	270pF 5% 50V 0603
2528	4822 126 14506	270pF 5% 50V 0603
2529	4822 126 13881	470pF 5% 50V
2530	3198 016 31020	0603 25V 1nF
2531	3198 016 31020	0603 25V 1nF
2532	4822 124 40207	100µF 20% 25V
2533	2020 012 93792	EL FG 16V S 100µF PM20 A
2534	4822 124 40207	100µF 20% 25V
2535	2020 552 94427	0603 50V 100P 5%
2536	4822 124 40207	100µF 20% 25V
2537	2020 552 94427	0603 50V 100P 5%
2538	4822 126 13881	470pF 5% 50V
2539	4822 126 14506	270pF 5% 50V 0603
2540	3198 016 31020	0603 25V 1nF

2541	3198 016 31020	0603 25V 1nF
2542	3198 016 31020	0603 25V 1nF
2543	3198 016 31020	0603 25V 1nF
2544	3198 016 31020	0603 25V 1nF
2545	3198 016 31020	0603 25V 1nF
2546	4822 124 80875	220µF 20% 25V
2547	4822 124 80875	220µF 20% 25V
2600	4822 126 14494	22nF 10% 25V 0603
2601	4822 126 13883	220pF 5% 50V
2602	4822 126 13883	220pF 5% 50V
2603	3198 017 44740	0603 10V 470nF COL
2604	4822 126 13883	220pF 5% 50V
2605	4822 126 13883	220pF 5% 50V
2606	4822 124 40433	47µF 20% 25V
2608	4822 124 40248	10µF 20% 63V
2609	4822 124 40207	100µF 20% 25V
2610	4822 124 40433	47µF 20% 25V
2612	4822 124 40248	10µF 20% 63V
2613	4822 124 80791	470µF 16V 20% 105C DXH=8X11.5
2614	4822 124 40207	100µF 20% 25V
2616	4822 124 40207	100µF 20% 25V
2617	2238 586 59812	0603 50V 100NP80M
2618	4822 124 40248	10µF 20% 63V
2619	4822 124 81144	1000µF 16V
2620	4822 124 40248	10µF 20% 63V
2621	2238 586 59812	0603 50V 100NP80M
2622	4822 126 11785	0603 50V 47P 5%
2623	4822 126 11785	0603 50V 47P 5%
2624	5322 126 11583	10nF 10% 50V 0603
2625	4822 124 40207	100µF 20% 25V
2626	4822 124 40207	100µF 20% 25V
2627	4822 124 80875	220µF 20% 25V
2628	4822 124 40433	47µF 20% 25V
2633	4822 124 40207	100µF 20% 25V
2634	2238 586 59812	0603 50V 100NP80M
2635	4822 124 40207	100µF 20% 25V
2636	2238 586 59812	0603 50V 100NP80M
2637	4822 124 40207	100µF 20% 25V
2638	2238 586 59812	0603 50V 100NP80M
2639	2238 586 59812	0603 50V 100NP80M
2640	2238 586 59812	0603 50V 100NP80M
2646	4822 124 40433	47µF 20% 25V

3100	4822 051 30101	100Ω 5% 0.062W
3101	4822 051 30101	100Ω 5% 0.062W
3102	4822 051 30101	100Ω 5% 0.062W
3103	4822 051 30101	100Ω 5% 0.062W
3104	4822 051 30101	100Ω 5% 0.062W
3105	4822 051 30101	100Ω 5% 0.062W
3106	4822 051 30101	100Ω 5% 0.062W
3107	4822 051 30101	100Ω 5% 0.062W
3108	4822 051 30101	100Ω 5% 0.062W
3109	4822 051 30472	4k7 5% 0.062W
3110	4822 051 30109	10Ω 5% 0.062W
3111	4822 051 30105	1M 5% 0.062W
3112	4822 051 30221	220Ω 5% 0.062W
3113	4822 051 30472	4k7 5% 0.062W
3114	4822 051 30472	4k7 5% 0.062W
3115	4822 051 30472	4k7 5% 0.062W
3116	4822 051 30472	4k7 5% 0.062W
3117	4822 051 30472	4k7 5% 0.062W
3118	4822 051 30472	4k7 5% 0.062W
3119	4822 051 30472	4k7 5% 0.062W
3120	4822 051 30479	47Ω 5% 0.062W
3123	4822 051 30479	47Ω 5% 0.062W
3124	4822 051 30332	3k3 5% 0.062W
3125	4822 051 30332	3k3 5% 0.062W
3126	4822 051 30332	3k3 5% 0.062W
3127	4822 051 30332	3k3 5% 0.062W
3128	4822 051 30479	47Ω 5% 0.062W
3129	4822 051 30105	1M 5% 0.062W
3130	4822 051 30221	220Ω 5% 0.062W
3200	4822 051 30273	27k 5% 0.062W
3201	4822 117 11151	1Ω 5%
3202	4822 117 11151	1Ω 5%
3203	4822 051 30273	27k 5% 0.062W
3204	4822 051 30472	4k7 5% 0.062W
3205	4822 051 30222	2k2 5% 0.062W
3206	4822 051 30222	2k2 5% 0.062W
3207	4822 051 30222	2k2 5% 0.062W
3208	4822 051 30331	330Ω 5% 0.062W
3210	4822 051 30222	2k2 5% 0.062W
3211	4822 051 30222	2k2 5% 0.062W
3212	4822 051 30472	4k7 5% 0.062W
3213	4822 051 30222	2k2 5% 0.062W
3214	4822 051 30222	2k2 5% 0.062W
3215	4822 051 30273	27k 5% 0.062W
3300	4822 051 30479	47Ω 5% 0.062W
3301	4822 051 30759	75Ω 5% 0.062W
3304	5322 117 13034	1k5 1% 0.063W 0603 RC22H
3305	5322 117 13018	1k0 1% 0.063W 0603 RC22H
3306	4822 051 30759	75Ω 5% 0.062W
3307	4822 051 30759	75Ω 5% 0.062W
3308	4822 051 30759	75Ω 5% 0.062W
3310	4822 051 30103	10k 5% 0.062W
3311	4822 051 30103	10k 5% 0.062W
3313	4822 051 30103	10k 5% 0.062W
3314	4822 051 30103	10k 5% 0.062W
3400	4822 051 30103	10k 5% 0.062W
3401	4822 051 30273	27k 5% 0.062W
3403	5322 117 13049	470Ω 1% 0.063W 0603 RC22H
3404	4822 051 30101	100Ω 5% 0.062W
3405	5322 117 13061	180Ω 1% 0.063W 0603 RC22H
3406	4822 051 30561	560Ω 5% 0.062W
3408	4822 051 30101	100Ω 5% 0.062W
3409	5322 117 13049	470Ω 1% 0.063W 0603 RC22H
3410	5322 117 13061	180Ω 1% 0.063W 0603 RC22H
3411	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3412	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3413	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3414	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3415	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3416	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3417	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3418	4822 051 30101	100Ω 5% 0.062W
3419	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3421	5322 117 13049	470Ω 1% 0.063W 0603 RC22H
3422	5322 117 13061	180Ω 1% 0.063W 0603 RC22H
3423	4822 051 30101	100Ω 5% 0.062W
3424	4822 051 30561	560Ω 5% 0.062W
3426	4822 051 30101	100Ω 5% 0.062W
3427	5322 117 13049	470Ω 1% 0.063W 0603 RC22H
3428	5322 117 13061	180Ω 1% 0.063W 0603 RC22H
3429	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3430	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3431	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3432	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3433	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3434	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3435	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3436	4822 051 30101	100Ω 5% 0.062W
3437	5322 117 13052	2k7 1% 0.063W 0603 RC22H
3438	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3439	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3440	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3441	5322 117 13046	1k8 1% 0.063W 0603 RC22H
3501	4822 051 30109	10Ω 5% 0.062W
3502	4822 051 30109	10Ω 5% 0.062W
3504	4822 051 30109	10Ω 5% 0.062W
3505	4822 051 30109	10Ω 5% 0.062W
3506	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3507	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3508	5322 117 13022	22k 1% 0.063W 0603 RC22H
3510	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3511	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3512	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3513	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3514	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3515	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3516	5322 117 13022	22k 1% 0.063W 0603 RC22H
3517	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3518	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3519	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3520	5322 117 13022	22k 1% 0.063W 0603 RC22H
3521	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3522	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3523	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3524	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3525	5322 117 13022	22k 1% 0.063W 0603 RC22H
3526	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3527	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3528	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3529	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3530	5322 117 13022	22k 1% 0.063W 0603 RC22H
3531	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3532	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3533	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3534	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3535	5322 117 13022	22k 1% 0.063W 0603 RC22H
3536	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3537	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3538	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3539	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3540	4822 051 30221	220Ω 5% 0.062W
3541	4822 051 30102	1k 5% 0.062W
3543	5322 117 13022	22k 1% 0.063W 0603 RC22H
3544	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3545	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3546	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3547	4822 117 12706	10k 1% 0.063W CASE0603 RC22H
3548	5322 117 13022	22k 1% 0.063W 0603 RC22H
3549	5322 117 13048	3k3 1% 0.063W 0603 RC22H
3550	4822 051 30221	220Ω 5% 0.062W
3551	4822 051 30102	1k 5% 0.062W
3552	4822 051 30103	10k 5% 0.062W
3553	4822 051 30103	10k 5% 0.062W
3555	4822 051 30471	470Ω 5% 0.062W
3556	4822 051 30102	1k 5% 0.062W
3558	4822 051 30471	470Ω 5% 0.062W
3560	4822 051 30102	1k 5% 0.062W
3561	4822 051 30103	10k 5% 0.062W
3562	4822 051 30103	10k 5% 0.062W
3563	4822 051 30221	220Ω 5% 0.062W
3564	4822 051 30102	1k 5% 0.062W
3566	4822 051 30221	220Ω 5% 0.062W
3567	4822 051 30102	1k 5% 0.062W
3568	4822 051 30103	10k 5% 0.062W
3570	4822 051 30103	10k 5% 0.062W
3571	4822 051 30221	220Ω 5% 0.062W
3572	4822 051 30102	1k 5% 0.062W
3574	4822 051 30221	220Ω 5% 0.062W
3575	4822 051 30102	1k 5% 0.062W
3576	4822 051 30103	10k 5% 0.062W
3577	4822 051 30103	10k 5% 0.062W
3579	4822 117 12925	47k 1% 0.063W 0603
3580	4822 051 30101	100Ω 5% 0.062W
3581	4822 051 30472	4k7 5% 0.062W
3582	4822 051 30103	10k 5% 0.062W
3583	4822 051 30103	10k 5% 0.062W
3584	4822 051 30103	10k 5% 0.062W
3590	4822 051 30332	3k3 5% 0.062W
3591	4822 117 12925	47k 1% 0.063W 0603
3592	4822 117 12925	47k 1% 0.063W 0603
3600	4822 051 30103	10k 5% 0.062W
3601	4822 051 30332	3k3 5% 0.062W
3602	4822 051 30223	22k 5% 0.062W
3603	4822 051 30222	2k2 5% 0.062W
3604	4822 051 30101	100Ω 5% 0.062W
3605	4822 051 30101	100Ω 5% 0.062W
3606	4822 051 30101	100Ω 5% 0.062W
3607	4822 051 30101	100Ω 5% 0.062W
3608	4822 051 30101	100Ω 5% 0.062W
3609	4822 051 30101	100Ω 5% 0.062W
3610	4822 051 30103	10k 5% 0.062W
3611	4822 051 30183	18k 5% 0.062W
3612	4822 051 30223	22k 5% 0.062W
3614	4822 051 30569	56Ω 5% 0.062W
3615	4822 051 30569	56Ω 5% 0.062W
3616	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3617	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3618	4822 051 30569	56Ω 5% 0.063W
3619	4822 051 30471	470Ω 5% 0.062W
3620	4822 051 30221	220Ω 5% 0.062W
3621	4822 051 30153	15k 5% 0.062W
3622	4822 051 30222	2k2 5% 0.062W
3623	4822 051 30759	75Ω 5% 0.062W
3624	4822 051 30222	2k2 5% 0.062W
3625	4822 051 30759	75Ω 5% 0.062W
3626	4822 051 30222	2k2 5% 0.062W
3627	4822 051 30759	75Ω 5% 0.062W
3628	4822 051 30222	2k2 5% 0.062W
3629	4822 051 30759	75Ω 5% 0.062W
3630	4822 051 30222	2k2 5% 0.062W
3631	4822 051 30759	75Ω 5% 0.062W

3632	4822 051 30222	2k2 5% 0.062W
3633	4822 051 30759	75Ω 5% 0.062W
3634	4822 051 30103	10k 5% 0.062W
3635	4822 051 30103	10k 5% 0.062W
3636	4822 051 30103	10k 5% 0.062W
3637	4822 117 12902	8k2 1% 0.063W 0603
3638	4822 051 30183	18k 5% 0.062W
3639	4822 051 30101	100Ω 5% 0.062W
3640	4822 051 30222	2k2 5% 0.062W
3641	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3642	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3643	4822 051 30101	100Ω 5% 0.062W
3644	4822 051 30101	100Ω 5% 0.062W
3645	4822 051 30222	2k2 5% 0.062W
3646	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3647	4822 051 30222	2k2 5% 0.062W
3648	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3652	4822 051 30562	5k6 5% 0.063W 0603 RC21 RST SM
3653	4822 051 30103	10k 5% 0.062W
3655	4822 051 30562	5k6 5% 0.063W 0603 RC21 RST SM
3659	4822 117 11151	1Ω 5%
3661	4822 117 11152	4Ω7 5%
3664	4822 117 11151	1Ω 5%
3665	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3666	4822 117 11151	1Ω 5%
3667	4822 117 11151	1Ω 5%
3669	4822 051 30101	100Ω 5% 0.062W
3670	4822 051 30101	100Ω 5% 0.062W
3671	4822 051 30472	4k7 5% 0.062W
3672	4822 117 12903	1k8 1% 0.063W 0603
3673	4822 051 30569	56Ω 5% 0.062W
3674	4822 051 30332	3k3 5% 0.062W
3675	4822 051 30332	3k3 5% 0.062W
3676	4822 051 30332	3k3 5% 0.062W
3677	4822 051 30471	470Ω 5% 0.062W
3678	4822 051 30222	2k2 5% 0.062W
3679	4822 051 30221	220Ω 5% 0.062W
3680	4822 051 30684	680k 5% 0.062W
3681	4822 051 30333	33k 5% 0.062W
3682	4822 051 30562	5k6 5% 0.063W 0603 RC21 RST SM
3683	4822 051 30103	10k 5% 0.062W
3684	4822 051 30103	10k 5% 0.062W

5300	4822 157 10586	2.2µH 10% 0805
5301	4822 157 10586	2.2µH 10% 0805
5601	2422 535 94092	IND FXD SM 0805 33U PM10 R
5602	2422 535 94092	IND FXD SM 0805 33U PM10 R
5603	2422 535 94092	IND FXD SM 0805 33U PM10 R
5606	4822 157 11074	100µH
5607	4822 157 70601	100µH (920927085A)

6500	4822 130 11397	BAS316
6602	4822 130 11522	UDZ15B
6603	4822 130 11522	UDZ15B
6604	4822 130 11522	UDZ15B
6606	4822 130 11397	BAS316
6607	4822 130 11522	UDZ15B

7100	9965 000 06673	TC7WHU04FU
7101	9965 000 06673	TC7WHU04FU
7102	4822 209 17441	74LVC74AD
7103	9965 000 06673	TC7WHU04FU
7105	9352 499 60118	IC SM 74LVC00AD (PHSE) R
7106	9352 499 60118	IC SM 74LVC00AD (PHSE) R
7107	5322 209 11578	PCF8574T
7121	9965 000 04199	BSN20
7122	9965 000 04199	BSN20
7200	4822 209 17455	74LVC157AD
7201	9322 177 89668	IC SM AD1895YRS (ANA0) R
7202	9352 115 40118	IC SM 74LVC245APW (PHSE) R
7203	9322 178 30669	IC SM AK4103VF (AKM0) R
7204	9352 105 20118	IC SM 74LVC161DB (PHSE) R
7205	9352 105 20118	IC SM 74LVC161DB (PHSE) R
7206	9352 424 10118	IC SM 74LVC04ADB (PHSE) R
7207	9322 186 80668	IC SM 74AC00M (ST00) R
7220	5322 130 60159	BC846B
7221	5322 130 60159	BC846B
7222	5322 130 60159	BC846B
7300	9322 177 92671	IC SM CS4362-KQ (CILO) Y
7301	9322 178 69668	IC SM AD1955ARS (ANA0) R
7400	5322 209 14481	HEF4053BT
7401	4822 209 30095	LM833D
7402	4822 209 30095	LM833D
7403	9322 184 52668	IC SM AD8022AR (ANA0) R
7404	9322 184 52668	IC SM AD8022AR (ANA0) R
7405	9322 190 07685	IC SM AD8032AR (ANA0) R
7420	4822 130 42804	BC817-25
7501	9352 202 10118	IC SM NE5532AD8 (PHSE) R
7502	9352 202 10118	IC SM NE5532AD8 (PHSE) R
7521	4822 130 42804	BC817-25
7522	4822 130 60373	BC856B
7523	4822 130 42804	BC817-25
7525	4822 130 42804	BC817-25
7527	4822 130 42804	BC817-25
7529	4822 130 42804	BC817-25
7531	4822 130 42804	BC817-25
7533	4822 130 42804	BC817-25
7535	4822 130 42804	BC817-25
7536	4822 130 60373	BC856B
7537	5322 130 60159	BC846B
7538	4822 130 60373	BC856B
7541	4822 130 60373	BC856B
7542	4822 130 60373	BC856B
7543	4822 130 60373	BC856B
7600	4822 209 17398	LD1117DT33
7601	9322 134 86668	LF80C
7602	9322 163 71668	IC SM MC79M08BDT (ONSE) R
7603	9322 140 81668	IC SM LF50CDT (ST00) R
7604	9322 155 28667	OPT FIB CON GP1FA550TZ (SRPJ)L
7620	5322 130 60159	BC846B
7621	4822 130 42804	BC817-25
7622	4822 130 42804	BC817-25
7623	4822 130 42804	BC817-25
7624	4822 130 42804	BC817-25
7625	4822 130 42804	BC817-25
7626	4822 130 42804	BC817-25
7627	5322 130 60159	BC846B
7628	5322 130 60159	BC846B
7629	5322 130 60159	BC846B
7630	5322 130 60159	BC846B
7631	4822 130 42804	BC817-25
7632	4822 130 42804	BC817-25
7633	4822 130 42804	BC817-25
7636	4822 130 60373	BC856B
7638	5322 130 60159	BC846B
7641	9322 163 53685	FET POW SM IRLML2502 (INR0) R
7642	5322 130 60159	BC846B
7643	5322 130 60159	BC846B

Front PWB

Various

0002	3139 244 00440	FTD HOLDER DVD711
1100	4822 267 10565	4P
1101	4822 276 13775	SWITCH
1102	4822 276 13775	SWITCH
1103	4822 276 13775	SWITCH
1104	4822 276 13775	SWITCH
1105	4822 276 13775	SWITCH
1106	4822 276 13775	SWITCH
1108	4822 267 10574	CON BM V 8P 2.50
1111	3139 240 50231	VFD 15-MT-70GNK (FTBO) Y
1112	4822 276 13775	SWITCH
1113	4822 276 13775	SWITCH
1114	4822 276 13775	SWITCH
1119	4822 242 72066	CST8,00MT
1201	4822 276 13775	SWITCH
1205	4822 267 10567	4P

2102	3198 017 34730	0603 16V 47nF COL
2103	4822 124 41584	100µF 20% 10V
2104	2020 552 94427	0603 50V 100P 5%
2105	2020 552 94427	0603 50V 100P 5%
2106	2020 552 94427	0603 50V 100P 5%
2107	4822 124 81151	22µF 50V
2108	5322 126 11578	1nF 10% 50V 0603
2122	4822 126 13883	220pF 5% 50V
2123	4822 126 13883	220pF 5% 50V
2124	4822 126 14549	33nF 16V O6O3
2127	4822 124 40207	100µF 20% 25V
2129	3198 017 34730	0603 16V 47nF COL
2131	4822 126 14549	33nF 16V O6O3
2135	4822 126 14549	33nF 16V O6O3
2136	4822 124 40433	47µF 20% 25V
2137	4822 122 33761	22pF 5% 50V
2138	4822 124 81151	22µF 50V
2139	4822 124 40769	4.7µF 20% 100V
2140	4822 126 14549	33nF 16V O6O3
2141	4822 126 14549	33nF 16V O6O3
2142	5322 126 11578	1nF 10% 50V 0603
2143	4822 124 81151	22µF 50V

3100	4822 051 30223	22k 5% 0.062W
3101	4822 117 12864	82k 5% 0.6W
3102	4822 117 12864	82k 5% 0.6W
3103	4822 051 30273	27k 5% 0.062W
3104	4822 117 12864	82k 5% 0.6W
3105	4822 051 30221	220Ω 5% 0.062W
3106	4822 117 12925	47k 1% 0.063W 0603
3107	4822 117 13632	100k 1% 0603 0.62W
3108	4822 051 30221	220Ω 5% 0.062W
3109	4822 051 30472	4k7 5% 0.062W
3110	4822 051 30472	4k7 5% 0.062W
3111	4822 051 30472	4k7 5% 0.062W
3112	4822 051 30472	4k7 5% 0.062W
3113	4822 051 30472	4k7 5% 0.062W
3114	4822 051 30472	4k7 5% 0.062W
3115	4822 051 30103	10k 5% 0.062W
3116	4822 051 30472	4k7 5% 0.062W
3117	4822 051 30472	4k7 5% 0.062W
3118	4822 051 30472	4k7 5% 0.062W
3119	4822 051 30103	10k 5% 0.062W
3120	4822 051 30472	4k7 5% 0.062W
3121	4822 051 30331	330Ω 5% 0.062W
3123	4822 051 30109	10Ω 5% 0.062W
3125	4822 051 30109	10Ω 5% 0.062W
3126	4822 051 30109	10Ω 5% 0.062W
3127	4822 117 11152	4Ω7 5%
3128	4822 117 11152	4Ω7 5%
3129	4822 051 30331	330Ω 5% 0.062W
3130	4822 051 30331	330Ω 5% 0.062W
3131	4822 051 30472	4k7 5% 0.062W
3133	4822 051 30471	470Ω 5% 0.062W
3134	4822 051 30109	10Ω 5% 0.062W
3135	4822 051 30102	1k 5% 0.062W
3138	4822 051 30103	10k 5% 0.062W
3139	4822 051 30471	470Ω 5% 0.062W
3140	4822 051 30103	10k 5% 0.062W
3141	4822 051 30103	10k 5% 0.062W
3142	4822 051 30109	10Ω 5% 0.062W
3146	4822 051 30471	470Ω 5% 0.062W
3147	4822 051 30471	470Ω 5% 0.062W
3148	4822 051 30103	10k 5% 0.062W
3149	4822 051 30103	10k 5% 0.062W
3150	4822 051 30331	330Ω 5% 0.062W
3151	4822 051 30331	330Ω 5% 0.062W
3152	4822 051 30471	470Ω 5% 0.062W
3153	4822 051 30471	470Ω 5% 0.062W
3154	4822 051 30103	10k 5% 0.062W
3155	4822 051 30103	10k 5% 0.062W
3156	4822 051 30331	330Ω 5% 0.062W
3157	4822 051 30331	330Ω 5% 0.062W
3158	4822 051 30221	220Ω 5% 0.062W
3200	4822 051 30101	100Ω 5% 0.062W

6100	9340 255 30135	BAS216
6101	9965 000 04709	UDZ6.2BTE-17
6103	9340 255 30135	BAS216
6104	9322 185 23676	LED VS LTL1CHTDK3 (LITO) A
6105	9322 185 23676	LED VS LTL1CHTDK3 (LITO) A
6106	9322 185 23676	LED VS LTL1CHTDK3 (LITO) A

6107	9322 185 23676	LED VS LTL1CHTDK3 (LITO) A
6200	9322 190 53676	LED VS LTL42HCWK5P (LITO) A

7100	5322 130 60159	BC846B
7101	5322 130 60159	BC846B
7102	5322 130 60159	BC846B
7103	5322 130 60159	BC846B
7104	4822 130 60373	BC856B
7105	5322 130 60159	BC846B
7106	4822 130 40981	BC337-25
7108	5322 130 60159	BC846B
7109	4822 130 40854	BC327
7111	4822 130 60373	BC856B
7112	4822 130 60373	BC856B
7113	4822 130 60373	BC856B
7114	4822 130 60373	BC856B
7401	3139 240 50221	TMP87CH74F-3NB2 DVDV2.21
7402	9322 155 82667	IR RECEIVER TSOP2236

P Scan PWB

Various

1000	2422 025 17599	CON BM H 24P F 1.00 FFC 0.3 R
1003	2422 026 05191	CON BM CINCH H 3P F RDBUGN B
1203	2422 127 00548	SWI SLID 1P 2POS SM SSSS21 R

2100	4822 124 81286	47µF 20% 16V
2101	2238 586 59812	0603 50V 100NP80M
2102	3198 017 44740	0603 10V 470nF COL
2103	4822 124 81286	47µF 20% 16V
2105	2238 586 59812	0603 50V 100NP80M
2106	2238 586 59812	0603 50V 100NP80M
2107	4822 124 81286	47µF 20% 16V
2108	4822 124 11947	10µF 20% 16V
2109	2238 586 59812	0603 50V 100NP80M
2110	2238 586 59812	0603 50V 100NP80M
2111	2238 586 59812	0603 50V 100NP80M
2112	2238 586 59812	0603 50V 100NP80M
2113	2238 586 59812	0603 50V 100NP80M
2114	2238 586 59812	0603 50V 100NP80M
2115	2238 586 59812	0603 50V 100NP80M
2116	2238 586 59812	0603 50V 100NP80M
2117	2238 586 59812	0603 50V 100NP80M
2118	2238 586 59812	0603 50V 100NP80M
2119	2238 586 59812	0603 50V 100NP80M
2120	2238 586 59812	0603 50V 100NP80M
2121	2238 586 59812	0603 50V 100NP80M
2122	2238 586 59812	0603 50V 100NP80M
2123	2238 586 59812	0603 50V 100NP80M
2124	2238 586 59812	0603 50V 100NP80M
2125	2238 586 59812	0603 50V 100NP80M
2126	2238 586 59812	0603 50V 100NP80M
2127	2238 586 59812	0603 50V 100NP80M
2128	2238 586 59812	0603 50V 100NP80M
2129	2238 586 59812	0603 50V 100NP80M
2130	4822 126 13879	220nF 20% 16V
2131	4822 126 13879	220nF 20% 16V
2132	4822 126 13879	220nF 20% 16V
2133	4822 126 13879	220nF 20% 16V
2134	2238 586 59812	0603 50V 100NP80M
2135	2238 586 59812	0603 50V 100NP80M
2136	2238 586 59812	0603 50V 100NP80M
2137	2238 586 59812	0603 50V 100NP80M
2138	2238 586 59812	0603 50V 100NP80M
2139	2238 586 59812	0603 50V 100NP80M
2140	4822 126 13879	220nF 20% 16V
2141	4822 126 13879	220nF 20% 16V
2142	4822 126 13879	220nF 20% 16V
2143	4822 126 13879	220nF 20% 16V
2144	4822 126 13879	220nF 20% 16V
2145	4822 126 13879	220nF 20% 16V
2146	4822 126 13879	220nF 20% 16V
2147	4822 126 13879	220nF 20% 16V
2148	2238 586 59812	0603 50V 100NP80M
2149	2238 586 59812	0603 50V 100NP80M
2150	4822 122 33741	10pF 10% 50V
2209	2238 586 59812	0603 50V 100NP80M
2210	2238 586 59812	0603 50V 100NP80M
2211	2238 586 59812	0603 50V 100NP80M
2212	2238 586 59812	0603 50V 100NP80M
2213	2238 586 59812	0603 50V 100NP80M
2214	2238 586 59812	0603 50V 100NP80M
2215	2238 586 59812	0603 50V 100NP80M
2216	2238 586 59812	0603 50V 100NP80M
2217	2238 586 59812	0603 50V 100NP80M
2218	2238 586 59812	0603 50V 100NP80M
2220	2238 586 59812	0603 50V 100NP80M
2221	5322 126 11579	3.3nF 10% 63V
2222	3198 016 38210	0603 25V 820P COL
2223	4822 124 40769	4.7µF 20% 100V
2300	2238 586 59812	0603 50V 100NP80M
2301	4822 122 33761	22pF 5% 50V
2302	4822 126 11785	0603 50V 47P 5%
2304	4822 124 40184	1000µF 20% 10V
2305	2238 586 59812	0603 50V 100NP80M
2306	2238 586 59812	0603 50V 100NP80M
2307	3198 017 44740	0603 10V 470nF COL
2308	4822 124 81286	47µF 20% 16V
2309	2238 586 59812	0603 50V 100NP80M
2310	4822 122 33761	22pF 5% 50V
2311	4822 126 11785	0603 50V 47P 5%
2313	2238 586 59812	0603 50V 100NP80M
2314	4822 124 40184	1000µF 20% 10V
2315	4822 124 81286	47µF 20% 16V
2316	2238 586 59812	0603 50V 100NP80M
2317	4822 122 33761	22pF 5% 50V
2318	4822 126 11785	0603 50V 47P 5%
2320	4822 124 81286	47µF 20% 16V
2321	4822 124 81286	47µF 20% 16V
2322	4822 124 81286	47µF 20% 16V
2323	4822 124 81286	47µF 20% 16V

3100	4822 051 30109	10Ω 5% 0.062W
3101	4822 051 30151	150Ω 5% 0.062W
3102	4822 117 12139	22Ω 5% 0.062W
3103	4822 117 12139	22Ω 5% 0.062W
3104	4822 117 12139	22Ω 5% 0.062W
3107	4822 051 30101	100Ω 5% 0.062W
3108	4822 051 30101	100Ω 5% 0.062W
3109	4822 117 12139	22Ω 5% 0.062W
3110	4822 117 12139	22Ω 5% 0.062W
3111	4822 117 12139	22Ω 5% 0.062W
3112	4822 117 12139	22Ω 5% 0.062W
3113	4822 117 12139	22Ω 5% 0.062W
3114	4822 117 12139	22Ω 5% 0.062W
3115	4822 117 12139	22Ω 5% 0.062W
3116	4822 117 12139	22Ω 5% 0.062W
3117	4822 117 12139	22Ω 5% 0.062W
3118	4822 117 12139	22Ω 5% 0.062W
3119	4822 117 12139	22Ω 5% 0.062W
3120	4822 117 12139	22Ω 5% 0.062W
3121	4822 117 12139	22Ω 5% 0.062W
3122	4822 117 12139	22Ω 5% 0.062W
3123	4822 117 12139	22Ω 5% 0.062W
3124	4822 117 12139	22Ω 5% 0.062W
3125	4822 117 12139	22Ω 5% 0.062W
3126	4822 117 12139	22Ω 5% 0.062W
3127	4822 117 12139	22Ω 5% 0.062W
3128	4822 117 12139	22Ω 5% 0.062W
3129	4822 117 12139	22Ω 5% 0.062W
3130	4822 117 12139	22Ω 5% 0.062W
3131	4822 117 12139	22Ω 5% 0.062W
3132	4822 117 12139	22Ω 5% 0.062W
3133	4822 117 12139	22Ω 5% 0.062W
3134	4822 117 12139	22Ω 5% 0.062W
3135	4822 117 12139	22Ω 5% 0.062W
3136	4822 117 12139	22Ω 5% 0.062W
3137	4822 117 12139	22Ω 5% 0.062W
3138	4822 117 12139	22Ω 5% 0.062W
3139	4822 117 12139	22Ω 5% 0.062W
3140	4822 117 12139	22Ω 5% 0.062W
3141	4822 117 12139	22Ω 5% 0.062W
3142	4822 117 12139	22Ω 5% 0.062W
3143	4822 117 12139	22Ω 5% 0.062W
3144	4822 117 12139	22Ω 5% 0.062W
3145	4822 117 12139	22Ω 5% 0.062W
3146	4822 117 12139	22Ω 5% 0.062W
3147	4822 117 12139	22Ω 5% 0.062W
3148	4822 117 12139	22Ω 5% 0.062W
3149	4822 117 12139	22Ω 5% 0.062W
3150	4822 051 30472	4k7 5% 0.062W
3151	4822 117 12139	22Ω 5% 0.062W
3152	4822 117 12139	22Ω 5% 0.062W
3153	4822 117 12139	22Ω 5% 0.062W
3154	4822 117 12139	22Ω 5% 0.062W
3155	4822 117 12139	22Ω 5% 0.062W
3156	4822 117 12139	22Ω 5% 0.062W
3157	4822 117 12139	22Ω 5% 0.062W
3158	4822 117 12139	22Ω 5% 0.062W
3159	4822 117 12139	22Ω 5% 0.062W
3160	4822 117 12139	22Ω 5% 0.062W
3161	4822 117 12139	22Ω 5% 0.062W
3162	4822 117 12139	22Ω 5% 0.062W
3163	4822 117 12139	22Ω 5% 0.062W
3164	4822 117 12139	22Ω 5% 0.062W
3165	4822 117 12139	22Ω 5% 0.062W
3166	4822 117 12139	22Ω 5% 0.062W
3170	4822 051 30008	0Ω jumper
3172	4822 051 30008	0Ω jumper
3173	4822 117 12139	22Ω 5% 0.062W
3174	4822 117 12139	22Ω 5% 0.062W
3175	4822 117 12139	22Ω 5% 0.062W
3176	4822 117 12139	22Ω 5% 0.062W
3177	4822 117 12139	22Ω 5% 0.062W
3178	4822 117 12139	22Ω 5% 0.062W
3179	4822 117 12139	22Ω 5% 0.062W
3180	4822 117 12139	22Ω 5% 0.062W
3181	4822 117 12139	22Ω 5% 0.062W
3182	4822 117 12139	22Ω 5% 0.062W
3183	4822 117 12139	22Ω 5% 0.062W
3201	4822 051 30472	4k7 5% 0.062W
3203	4822 051 30152	1k5 5% 0.062W
3204	4822 117 12139	22Ω 5% 0.062W
3205	4822 051 30152	1k5 5% 0.062W
3206	4822 117 12139	22Ω 5% 0.062W
3207	4822 051 30472	4k7 5% 0.062W
3208	4822 051 30472	4k7 5% 0.062W
3209	4822 051 30101	100Ω 5% 0.062W
3210	4822 051 30103	10k 5% 0.062W
3211	4822 051 30101	100Ω 5% 0.062W
3212	4822 051 30103	10k 5% 0.062W
3213	4822 051 30101	100Ω 5% 0.062W
3214	4822 051 30101	100Ω 5% 0.062W
3215	4822 051 30472	4k7 5% 0.062W
3216	4822 051 30681	680Ω 5% 0.062W
3300	4822 051 30759	75Ω 5% 0.062W
3302	2322 704 63001	300R 1% 0.063W 0603
3303	2322 704 63001	300R 1% 0.063W 0603
3305	4822 051 30102	1k 5% 0.062W
3306	2322 704 63002	3k 1% 0.063W 0603
3307	4822 051 30759	75Ω 5% 0.062W
3309	2322 704 63001	300R 1% 0.063W 0603
3310	2322 704 63001	300R 1% 0.063W 0603
3312	4822 051 30102	1k 5% 0.062W
3313	2322 704 63002	3k 1% 0.063W 0603
3314	4822 117 11152	4Ω7 5%
3316	2322 704 63001	300R 1% 0.063W 0603
3317	2322 704 63001	300R 1% 0.063W 0603
3319	4822 051 30759	75Ω 5% 0.062W
3320	4822 051 30102	1k 5% 0.062W
3321	2322 704 63002	3k 1% 0.063W 0603

5100	4822 051 30008	0 ohm jumper
5101	4822 157 71593	10µH 10%
5102	4822 157 71593	10µH 10%
5201	4822 157 71593	10µH 10%
5202	4822 157 11716	BLM21P300SPT
5203	4822 157 11716	BLM21P300SPT
5300	4822 157 10977	4.7µH 10%
5301	3198 018 31580	FXDIND SM 0805 1U5 PM10 COL R
5302	4822 051 30008	0R00 JUMPER
5305	4822 157 10977	4.7µH 10%
5306	3198 018 31580	FXDIND SM 0805 1U5 PM10 COL R
5307	4822 157 10977	4.7µH 10%
5308	3198 018 31580	FXDIND SM 0805 1U5 PM10 COL R
5309	4822 157 71593	10µH 10%
5310	4822 157 71593	10µH 10%
5311	4822 157 71593	10µH 10%
5312	4822 157 71593	10µH 10%

7100	9322 189 94671	IC SM FLI2310
7101	9322 166 71668	IC SM MT48LC2M32B2TG-6 (MRN0)R
7103	9322 179 78668	IC SM LF18ABDT (ST00) R
7200	9352 092 60118	IC SM 74LVT74DB (PHSE) R
7201	5322 209 11578	PCF8574T
7202	9322 178 70671	IC SM ADV7300ST (ANA0) Y
7203	9352 092 90118	IC SM 74LVT86DB (PHSE) R
7300	9322 142 88668	IC SM LF25CDT (ST00) R
7301	9322 167 49685	IC SM AD8061ART (ANA0) R
7302	9322 167 49685	IC SM AD8061ART (ANA0) R
7303	9322 167 49685	IC SM AD8061ART (ANA0) R

SCART PWB

Various

1000	2422 025 12352	CON BM EURO H 21P F BK GRND-L
1001	2422 025 12352	CON BM EURO H 21P F BK GRND-L
1300	2422 025 16526	CON BM V 22P F 1.00 FFC 0.3 R

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2100	4822 124 11947	10µF 20% 16V
2101	4822 124 40207	100µF 20% 25V
2102	4822 126 14305	100nF 10% 16V 0603
2103	4822 126 14305	100nF 10% 16V 0603
2104	4822 126 14305	100nF 10% 16V 0603
2105	4822 122 33777	47pF 5% 63V
2106	4822 122 33777	47pF 5% 63V
2107	4822 126 14305	100nF 10% 16V 0603
2108	4822 126 14305	100nF 10% 16V 0603
2109	4822 126 14305	100nF 10% 16V 0603
2110	4822 124 41584	100µF 20% 10V
2111	4822 126 14494	22nF 10% 25V 0603
2112	4822 126 14305	100nF 10% 16V 0603
2113	4822 126 14305	100nF 10% 16V 0603
2114	3198 017 44740	0603 10V 470nF COL
2115	3198 017 44740	0603 10V 470nF COL
2116	3198 017 44740	0603 10V 470nF COL
2117	4822 124 11947	10µF 20% 16V
2118	4822 124 11947	10µF 20% 16V
2119	4822 124 21732	10µF 20% 25V
2120	3198 017 44740	0603 10V 470nF COL
2121	4822 124 40207	100µF 20% 25V
2122	4822 126 14305	100nF 10% 16V 0603
2200	4822 124 12032	4.7µF 20% 50V
2201	4822 126 13883	220pF 5% 50V
2202	4822 124 12032	4.7µF 20% 50V
2203	4822 124 12032	4.7µF 20% 50V
2204	4822 124 12032	4.7µF 20% 50V
2205	4822 122 31765	100pF 2% 63V 1206
2206	4822 126 13883	220pF 5% 50V
2207	4822 126 13883	220pF 5% 50V
2208	4822 126 13883	220pF 5% 50V
2209	4822 126 13883	220pF 5% 50V
2210	4822 126 13883	220pF 5% 50V
2211	4822 124 21732	10µF 20% 25V
2212	4822 124 12032	4.7µF 20% 50V
2213	4822 124 12032	4.7µF 20% 50V
2214	4822 124 12032	4.7µF 20% 50V
2215	4822 124 12032	4.7µF 20% 50V
2216	4822 126 13883	220pF 5% 50V
2217	4822 126 13883	220pF 5% 50V
2218	4822 122 31765	100pF 2% 63V 1206
2219	4822 124 11947	10µF 20% 16V
2220	4822 126 13883	220pF 5% 50V
2221	4822 124 11947	10µF 20% 16V
2222	4822 126 13883	220pF 5% 50V
2223	4822 126 13883	220pF 5% 50V
2224	4822 126 13883	220pF 5% 50V
2225	4822 124 21732	10µF 20% 25V
2226	4822 126 13883	220pF 5% 50V

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3100	4822 117 11152	4Ω7 5%
3102	4822 051 30103	10k 5% 0.062W
3104	4822 051 30472	4k7 5% 0.062W
3105	4822 051 30103	10k 5% 0.062W
3106	4822 051 30103	10k 5% 0.062W
3107	4822 051 30101	100Ω 5% 0.062W
3108	4822 051 30101	100Ω 5% 0.062W
3109	4822 051 30472	4k7 5% 0.062W
3110	4822 051 30103	10k 5% 0.062W
3111	4822 051 30102	1k 5% 0.062W
3112	4822 051 30472	4k7 5% 0.062W
3113	4822 051 30103	10k 5% 0.062W
3114	4822 051 30471	470Ω 5% 0.062W
3115	4822 051 30471	470Ω 5% 0.062W
3116	4822 051 30103	10k 5% 0.062W
3117	4822 051 30472	4k7 5% 0.062W
3200	4822 051 30221	220Ω 5% 0.062W
3201	4822 117 12925	47k 1% 0.063W 0603
3202	4822 051 30471	470Ω 5% 0.062W
3203	4822 051 30273	27k 5% 0.062W
3204	4822 117 12925	47k 1% 0.063W 0603
3205	4822 051 30221	220Ω 5% 0.062W
3206	4822 117 12925	47k 1% 0.063W 0603
3207	4822 051 30273	27k 5% 0.062W
3208	4822 117 12925	47k 1% 0.063W 0603
3209	4822 051 30471	470Ω 5% 0.062W
3210	4822 051 30471	470Ω 5% 0.062W
3211	4822 051 30101	100Ω 5% 0.062W
3212	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3213	4822 051 30471	470Ω 5% 0.062W
3214	4822 051 30471	470Ω 5% 0.062W
3215	4822 051 30101	100Ω 5% 0.062W
3216	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3217	4822 051 30151	150Ω 5% 0.062W
3218	4822 051 30101	100Ω 5% 0.062W
3219	4822 051 30472	4k7 5% 0.062W
3220	4822 051 30472	4k7 5% 0.062W
3221	4822 051 30472	4k7 5% 0.062W
3222	4822 117 13632	100k 1% 0603 0.62W
3223	4822 051 30471	470Ω 5% 0.062W
3224	4822 051 30151	150Ω 5% 0.062W
3225	4822 051 30471	470Ω 5% 0.062W
3226	4822 051 30472	4k7 5% 0.062W
3227	4822 051 30471	470Ω 5% 0.062W
3228	4822 051 30222	2k2 5% 0.062W
3229	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3230	4822 051 30759	75Ω 5% 0.062W
3231	4822 051 30561	560Ω 5% 0.062W
3232	4822 051 30101	100Ω 5% 0.062W
3233	4822 051 30471	470Ω 5% 0.062W
3234	4822 051 30339	33Ω 5% 0.062W
3235	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3236	4822 051 30472	4k7 5% 0.062W
3237	4822 051 30562	5k6 5% 0.063W 0603 RC21 RST SM
3238	4822 051 30479	47Ω 5% 0.062W
3239	4822 051 30472	4k7 5% 0.062W
3240	4822 051 30102	1k 5% 0.062W
3241	4822 117 12925	47k 1% 0.063W 0603
3242	4822 051 30471	470Ω 5% 0.062W
3243	4822 117 12925	47k 1% 0.063W 0603
3244	4822 051 30272	2k7 5% 0.062W
3245	4822 051 30102	1k 5% 0.062W
3246	4822 117 12925	47k 1% 0.063W 0603
3247	4822 051 30471	470Ω 5% 0.062W
3248	4822 117 12925	47k 1% 0.063W 0603
3249	4822 051 30102	1k 5% 0.062W
3250	4822 117 12925	47k 1% 0.063W 0603
3251	4822 051 30471	470Ω 5% 0.062W
3252	4822 051 30471	470Ω 5% 0.062W
3253	4822 051 30472	4k7 5% 0.062W
3254	4822 051 30759	75Ω 5% 0.062W
3255	4822 051 30472	4k7 5% 0.062W
3257	4822 051 30759	75Ω 5% 0.062W
3258	4822 051 30471	470Ω 5% 0.062W
3259	4822 051 30339	33Ω 5% 0.062W
3260	4822 051 30561	560Ω 5% 0.062W
3261	4822 051 30472	4k7 5% 0.062W
3262	4822 051 30759	75Ω 5% 0.062W
3263	4822 051 30472	4k7 5% 0.062W
3264	4822 051 30479	47Ω 5% 0.062W
3266	4822 051 30759	75Ω 5% 0.062W
3267	4822 051 30472	4k7 5% 0.062W
3268	4822 051 30101	100Ω 5% 0.062W
3269	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3270	4822 051 30471	470Ω 5% 0.062W
3271	4822 051 30759	75Ω 5% 0.062W
3272	4822 051 30273	27k 5% 0.062W
3273	4822 117 12925	47k 1% 0.063W 0603
3275	4822 051 30272	2k7 5% 0.062W
3276	4822 051 30472	4k7 5% 0.062W
3277	4822 051 30561	560Ω 5% 0.062W
3278	4822 051 30561	560Ω 5% 0.062W

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6208	9340 548 63115	PDZ15B

7102	4822 130 60511	BC847B
7103	4822 130 60511	BC847B
7104	4822 130 60511	BC847B
7105	4822 130 60511	BC847B
7106	4822 130 40854	BC327
7200	4822 130 42804	BC817-25
7201	4822 130 42804	BC817-25
7202	4822 130 60511	BC847B
7203	4822 130 60511	BC847B
7204	4822 130 60511	BC847B
7205	4822 130 60373	BC856B
7206	4822 130 60511	BC847B
7207	4822 130 60511	BC847B
7208	4822 130 60511	BC847B
7209	4822 130 60511	BC847B
7210	4822 130 42804	BC817-25
7211	4822 130 42804	BC817-25
7212	4822 130 60511	BC847B
7213	4822 130 60373	BC856B
7214	4822 130 60511	BC847B
7215	4822 130 42804	BC817-25
7216	4822 130 42804	BC817-25
7217	4822 130 60511	BC847B
7218	4822 130 60511	BC847B
7219	4822 130 42804	BC817-25
7220	4822 130 42804	BC817-25
7500	9322 134 86668	LF80C
7501	9322 135 59671	STV6411AD